

BEER BREWING 101

A good place for any brewer to begin, and where many of us stay for a long time, is extract brewing. This is simply brewing from cans of thick syrupy malt extract (sometimes in powdered form), along with a few other basic ingredients. You can move up to brewing with partial or all grain if you want.

Here is all of the equipment you'll need to make a five-gallon batch, plus a few extras:

- 1 4-7 gallon stainless steel cooking pot (now officially a brew kettle)
- 1 5-gallon food-grade plastic bucket with a lid and a spigot
- 1 5-gallon glass or food-grade plastic carboy (AKA, a large jug)
- 5-6 feet of 3/8- to 5/8-inch ID (inner diameter) diameter vinyl tubing
- 1 large funnel (optional) & 1 funnel screen, sieve or colander (optional)
- 1 long stirring spoon
- 1 hydrometer for checking gravity, AKA potential alcohol level (optional)
- 1 cork with a hole (AKA, bung) that fits snugly in the opening of your carboy, and which in turn holds your airlock
- Scent-free dish detergent, hydrogen peroxide, no-rinse cleaner and sanitizer (optional)
- 1 fine mesh nylon straining bag or cheesecloth (optional; only use if mashing grains)
- 1 high-temp brewing or candy thermometer
- 60 new or used 12-oz/ beer bottles (avoid screw-tops) or 25 cappable champagne bottles
- 60 unused bottle caps
- Bottle capper

Here are some basic ingredients you'll need for most five-gallon batches:

- 1 5-gallon extract brewing ingredient kit (should include everything you need for the recipe)
- Large bag of ice or 2-3 gallons of very cold water (from the initial five gallons)

Or build your own kit with:

- 5 gallons (20 liters) spring water or de-chlorinated tap water
- Liquid or dried malt extract of your choosing (the amount will vary based on your recipe)
- Flavoring / adjunct grains (optional)
- Hops, herbs, spices, etc.
- Yeast
- Corn sugar or honey for priming when bottling

Brew day

Ah, Brew Day. It sounds like such a romantic notion. If you're anything like me, images of clichéd Norman Rockwell farmers quaffing ale while chewing on a piece of straw and attending to bubbling pots of brew float through your head while you prepare for an exciting-yet-relaxing day of brewing. Admittedly, it can eventually come close to this (mentally at least), but no matter how many times you do brew beer, the big day will inevitably have some unexpected kinks. To make sure you're not caught by surprise, there are a few things you should do before every Brew Day:

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1. Set aside a full day so you have time to take care of any last minute items; you may not always need a full day, but for your first couple of tries, don't plan anything else potentially time-consuming that day. Shoot for starting by at least early afternoon, unless you're a night owl.
2. Plan carefully at least a day or two in advance. Look through whatever recipe or process description you're following, and double-check all equipment and ingredients.
3. Clean, sterilize with heat (or sanitize with sanitizing chemicals if you desire) and rinse all equipment that will be in contact with the wort the night before brew day or a few hours before you begin brewing; this is a good opportunity to make sure you're not missing anything vital.
4. Prepare yourself mentally. Your first couple of brew days will likely be chaotic, but they needn't be. Something unexpected will always come up, usually during a time-sensitive part of the process. The trick is to make sure you're ready to react without turning your kitchen into a warzone.
5. Come time to start, put on some good music, grab a beer, and get started.

Once you're ready to delve in, set all equipment out that you will need for the boiling process (and have equipment needed for the next steps on hand) and make sure anyone else who may want your attention is aware that you need to spend the next hour or so boiling wort. (*This is critical, as an unattended pot can lead to disaster*). Start by bringing 1 1/2 gallons of water to a near boil in your brew kettle. (If you're following a partial mash recipe, you'll first want to "mash" the grains by bringing the temperature to approximately 150° Fahrenheit and placing the grains into the wort in a grain bag or cheesecloth for a half hour. Remove the bag carefully with a metal spoon and give the excess wort some time to drain off, gently helping it along with the spoon; don't press the bag to get more wort out, as you may extract some unwanted bittering tannins. From here, proceed to the boil. While waiting, open your bag(s) or can(s) of extract. Since you'll want to get as much liquid extract from the can as possible, it helps to warm the extract beforehand by placing the can in a pot of water on medium-high heat for a few minutes.

When the water in your brew kettle begins to show signs of boiling, cut the heat off. Open the extract can (or *fully* cut open a bag of dry extract), have a stirring spoon ready in your other hand, and pour with one hand while stirring vigorously with the other, taking care to scrape the bottom of the kettle. This keeps the extract from sticking to the bottom and burning, but also prevents boiling over. Once you have as much of the liquid extract into the kettle as you're able, grab an oven mitt and carefully use hot water from the brew pot to work the rest of the extract from the can. Return the heat to medium high and start stirring like crazy. This is *absolutely* the part of the process that needs to be attended to the most vigilantly. I'd warrant that nearly every beer-brewer has experienced a boil-over at some point. If you do, take the pot off the heat quickly, clean up the mess (it will turn rock hard if you leave it for later!), get the boil under control and get back to stirring.

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Continue stirring until the wort reaches a steady, rolling boil. Once you have a steady boil, you can stop stirring constantly, but continue to attend to it and stir every couple of minutes, particularly if you see foam starting to rise on the surface. Go ahead and set a timer for 60 minutes (or set it for the various increments at which you'll be adding hops and other flavoring and bittering agents). I find that it takes about twenty minutes of reaching the initial boil before I'm comfortable stepping away even for a couple of seconds. Keep the lid off, or only partially on throughout the process, as this can cause the wort to foam over. Be sure you have your ingredients ready to add during the various periods they're called for. If you're using a beer kit or following a recipe, add the hops and other ingredients according to the ingredients schedule. Hops added early in the process (at the beginning of or 30 minutes into a 60-minute boil) will contribute largely to bittering, while hops added from 15 minutes to the end of the boil will be more for aroma. The most aroma will come from hops that are added within the last two-to-five minutes. Ingredients other than hops (such as herbs and spices) added during the last two-to-five minutes will impart aroma and flavor. Herbs and plants such as mugwort, yarrow and dandelion greens are intended for bittering and can be added during the last 15-30 minutes instead of hops.

At the 60-minute mark, it's important to lower the temperature of the wort to (60°-80° Fahrenheit) as quickly as possible. If left to cool on its own you provide the opportunity for beer-spoilage bacteria to affect the final product, giving it an unpleasant off-flavor. If you pre-cooled 2-3 gallons of water, you can pour it through a funnel into your carboy and carefully add the hot wort if you have a small brew kettle (DO NOT add hot wort directly to a glass carboy or it will crack), or you can add as much of the ice water as will fit to the brew kettle. If pouring directly into a carboy or bucket, slosh the wort vigorously from time to time to ensure an even mix. If pouring directly into a brewing bucket, add the hot water first for additional sterilization and follow with the cold water. Another option is to create an ice bath by putting ice and cold water in a bathtub or large sink and setting your brew pot in it. Be sure to have at least a couple of pounds of ice on hand, as it will melt quickly. You can also purchase or build a copper immersion chiller to accomplish this quicker. After you have cooled the wort, it's time to check the original gravity (OG) with your hydrometer, which you will later measure against the final gravity (FG) to determine the approximate alcohol content. Follow the instructions that came with the hydrometer. Next, open your yeast packet and sprinkle it over the surface. Place a cork and airlock on the carboy and set it in a warm, dark corner (60°-80° Fahrenheit). You may need to rinse out the airlock while fermentation is active, as the yeast may cause the wort to exude *krausen* (foam). Some brews produce a *lot* of krausen. For these you can either not fill the carboy up all the way until fermentation slows down, place a five-gallon batch into a six- or seven-gallon fermenter, or remove the airlock and insert some vinyl tubing into the bung, placing the other end into a small pot with enough water to keep the end covered.

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Secondary Fermentation

Once *primary fermentation* is complete (about 5-7 days after Brew Day), it's time to *rack* (transfer) to your *secondary fermenter*, preferably a bucket with a spigot. During primary fermentation, a lot of sediment will have developed on the bottom of your primary fermenter. This is called *lees* or the *yeast cake*. Essentially, the yeast have eaten up most of the sugars and pooped out alcohol and CO₂. Yes, you will be drinking yeast poop. Although some yeast will still be floating around in boozy bliss, most of them are slumbering off their hangovers at the bottom of the fermenter. You want as much of the lees as possible to stay behind. To accomplish this:

1. Set the primary fermenter on a table or large stool, taking care to not disturb the lees too much;
2. Place your secondary fermenter directly below it;
3. Take your vinyl tubing, place it just a bit above the lees and tape it or fasten it in some other fashion to the opening of the primary fermenter to keep it from moving;
4. Start the siphon with your mouth and place the siphon in the secondary fermenter;
5. Dump the sludgy stuff left in the bottom of the primary, preferably in your compost pile;
6. Take a hydrometer reading now and every couple of days;
7. Once the hydrometer reading is steady, fermentation is done and it's time for bottling!

Bottling

You can bottle in pretty much anything you want, but typically you'll be bottling in used (or new) non screw-top beer bottles with a bottle capper and new caps. Before bottling, you'll want to *prime*; this is simply adding some sort of sugar to restart fermentation slightly for bottle-conditioning, which will result in a carbonated beer. I prefer honey, but most brewing kits come with corn sugar, which will work too.

1. Take about two cups of beer and place it in a pot on the stove;
2. Warm it just enough to dissolve your sugar source and stir in either ½ cup of honey or ¾ cup of sugar (recipes will vary; check your recipe or look for an online priming calculator);
3. Pour the sugary beer back into the bottling bucket and stir gently but thoroughly;
4. Leave it to rest for at least a half hour to allow any sediment to settle on the bottom;
5. Proceed to bottle, either placing the bottles directly under the spigot, using a small funnel, or using a bottling attachment (sold separately in homebrew stores);
6. Fill to about half an inch below the opening and cap with your capper;
7. Give bottles at least a week to fully carbonate (two weeks is better; you'll be glad you waited);
8. Drink some beer!

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