

# Basic Ingredients

The following is a basic beer recipe:

- 5-7 pounds of Hopped Pale Malt Extract syrup (OG of 1.038 – 1.053)□
- 5 gallons of water
- 1-2 ounces of Hops (if desired for more hop character) □
- 1 packet of dry Ale yeast, plus 1 packet for back-up
- 3/4 cup corn sugar for Priming.□

This is a basic Ale beer and quite tasty. You will be amazed. Further descriptions of the ingredients follow.

**MALT EXTRACT:** Using Malt Extract is what makes first time brewing simple. Malt Extract is the concentrated sugars extracted from malted barley. It is sold in both the liquid (LME) and powdered forms (DME). The syrups are approximately 20 percent water, so 4 pounds of dry Malt Extract (DME) is roughly equal to 5 pounds of Malt Extract (LME) syrup. Malt Extract is available in both the Hopped and Unhopped varieties. Screen the ingredients to avoid corn sugar. Munton & Fison, Alexanders, Coopers, Edme and Premier are all good brands. Laaglander is another good brand but the brewer needs to be aware that it contains extra unfermentables which add to the body, making the beer finish with an FG of about 1.020. Using Unhopped extract means adding 1-2 ounces of Hops during the boil for bittering and flavor. Hops may also be added to the Hopped Extracts towards the end of the boil for more Hop character in the final beer. Unhopped extract is preferable for brewers making their own recipes.

A rule of thumb is 1 pound of malt extract (syrup) per gallon of water for a light bodied beer. One and a half pounds per gallon produces a richer, full bodied beer. One pound of malt extract syrup typically yields a gravity of 1.034 – 38 when dissolved in one gallon of water. Dry malt will yield about 1.040 – 43. Malt extract is commonly available in Pale, Amber and Dark varieties, and can be mixed depending on the style of beer desired. Wheat malt extract is also available and more new extracts are coming out each year. With the variety of extract now available, there is almost no beer style that cannot be brewed using extract alone.

The next step in complexity for the homebrewer is to learn how to extract the sugars from the malted grain himself. This process, called Mashing, allows the brewer to take more control of producing the wort. This type of homebrewing is referred to as All-Grain brewing.

**WATER:**

The water is very important to the resulting beer. After all, beer is mostly water. If your tap water tastes good at room temperature, it should make good beer. It will just need to be boiled for a few minutes to remove the chlorine and kill any bacteria. If the water has a metallic taste, boil and let it cool before using to let the excess minerals settle out, and pour it off to another vessel. Do not use water from a salt based water softener. A good bet for your first batch of beer is the bottled water sold in most supermarkets as Drinking Water. Use the 2.5 gallon containers. Use one container for boiling the extract and set the other aside for addition to the fermenter later.

### **HOPS:**

This is another involved subject. There are many varieties of Hops, but they are divided into two main categories: Bittering and Aroma. Bittering Hops are high in Alpha Acids (the main bittering agent), typically around 10 percent. Aroma Hops are lower, around 5 percent. Several Hop varieties are in between and are used for both purposes. Bittering Hops are added at the start of the boil and usually boiled for an hour. Aroma Hops are added towards the end of the boil and are typically boiled for 15 minutes or less (Finishing). Hops can also be added to the fermenter for increased hop aroma in the final beer, called Dry Hopping, but this is best done during Secondary Fermentation. A mesh bag, called a Hop Bag, may be used to help retain the hops and make removal of the Hops easier prior to fermentation. Straining or removal of the Hops before fermentation is largely a matter of personal preference.

Published beer recipes often include a Hops schedule, with amounts and boil times specified. Other recipes specify the Hops in terms of AAUs and IBUs. AAUs are a convenient unit for specifying Hops when discussing Hop additions because it allows for variation in the Alpha Acid percentages between Hop varieties. For example, if 7 AAUs are recommended for the Boil (60 minutes) and 4 AAUs for Finishing (15 minutes). This is assuming the use of Unhopped malt extract; if using Hopped, then only add the 4 AAUs for finishing. These amounts correspond to 22 IBUs for the boil, and 1.25 IBU for the finish. IBUs allow for variation in brewing practices between brewers, yet provide for nearly identical final Hop bitterness levels in the beer.

### **THE WORT AND OXYGEN:**

The use of oxygen in brewing is a double-edged sword. The yeast need oxygen to grow and multiply enough to provide a good fermentation. When the yeast has first been pitched, whether to the starter or the beer, it first seeks to reproduce. The yeast makes use of the dissolved oxygen in the wort for this. Boiling the wort drives out the dissolved oxygen, which is why aeration of some sort is needed prior to fermentation. The yeast first use up all of the oxygen in the wort for reproduction, then get down to the business of turning sugar into alcohol and CO<sub>2</sub> as well as processing the other flavor compounds.

On the other hand, if oxygen is introduced while the wort is still hot, the oxygen will oxidize the wort and the yeast cannot utilize it. This will later cause oxidation of the beer which gives a wet cardboard taste. The key is temperature. The generally accepted temperature cutoff for preventing hot wort oxidation is 80F. In addition, if oxygen is introduced after the fermentation has started, it will not be utilized by the yeast and will later cause the wet cardboard or sherry-like flavors.

This is why it is important to cool the wort rapidly to below 80F, to prevent oxidation, and then aerate it by shaking or whatever to provide the dissolved oxygen that the yeast need. Cooling rapidly between 90 and 130F is important because this region is ideal for bacterial growth to establish itself in the wort.

Most homebrewers use cold water baths around the pot or copper tubing Wort Chillers to accomplish this cooling in about 20 minutes or less. A rapid chill also causes the Cold Break material to settle out, which decreases the amount of protein Chill Haze in the finished beer. Aeration of the wort can be accomplished several ways: shaking the container, pouring the wort into the fermenter so it splashes, or even hooking up an airstone to an aquarium air pump and letting that bubble for an hour. For the latter method, (which is popular) everything must be sanitized! Otherwise, Infection City. These instructions recommend shaking the starter and pouring/shaking the wort. More on this later.

Sanitization So far, sanitization of ingredients and equipment has been discussed but not much has been said about how to do this. The definition and objective of sanitization is to reduce bacteria and contaminants to insignificant or manageable levels. Sterilization is not really possible. The Starter solution, Wort and Priming solutions will all be boiled, so those are not a problem (usually). □ One note – Do Not Boil the Yeast! You need them to be alive.

We recommend using a no-rinse sanitizer such as Star-San, One Step, Iodiphor, or something similar. Mix the sanitizer according to the manufacturer's directions and apply to all equipment that will come in contact with your wort after the boil, and drain as much of the sanitizer solution from the equipment as possible. No rinsing required! Some sanitizers require letting the solution dry before using the equipment, but some can be used wet. Refer to the manufacturers instructions for contact times and drying requirements. One very useful tool for small parts to be sanitized is a spray bottle; you can purchase a spray bottle from your local garden shop or dollar store. Fill the spray bottle with freshly made sanitizing solution and you can spray down equipment as needed during your brew day. Most no-rinse sanitizers require only a few minutes of contact time, which can speed up your brew day!

Clean all equipment as soon as possible. This means rinsing out the fermenter, tubing, etc. as soon as they are used. It is very easy to get distracted and come back to find the syrup or yeast has dried hard as a rock and the equipment is stained. Keep a large container with a solution of P.B.W. or another food grade cleaner handy and just toss things in, clean later.

Rinsing bottles after each use eliminates the need to scrub bottles. If your bottles are dirty, moldy or whatever, soaking and washing in a mild solution of chlorine bleach water for a day or two will soften most residue. Brushing with a bottle brush is a necessity to remove stuck residue. Dish washers are great for cleaning the outside of bottles and heat sterilizing, but will not clean the inside where the beer is going to go; that must be done beforehand. P.B.W. also works very well but must be rinsed carefully. Do not wash with soap. This leaves a residue which you will be able to taste. Never use any scented cleaning agents, these odors can be absorbed into the plastic buckets and manifest in the beer. Fresh-Lemon Scented Pinesol Beer is not very good. Also, dishwasher Rinse Agents will destroy the Head retention on your glassware. If you pour a beer with carbonation and no head, this is a common cause.

## **YEAST:**

There are several aspects to yeast; it is the other major factor in determining the flavor of the beer. Different yeast strains will produce different beers when pitched to identical worts. Yeast is available both wet and dry, for Ale and Lager, et cetera. For the first-time brewer, a dry Ale yeast is highly recommended. There are several brands available, including Coopers, Edme, Nottingham, and Red Star. All of these listed will produce good results. □Ale yeasts are referred to as top-fermenting because much of the fermentation action takes place at the top of the fermenter, while Lager yeasts would seem to prefer the bottom. While many of today's strains like to confound this generalization, there is one important difference, and that is temperature. Ale yeasts like warmer temperatures, going dormant below 55F (12C), while Lager yeasts will happily work at 40F. Using Lager yeast at Ale temperatures 65-70F (18-20C) produces Steam Beer, or what is now termed California Common Beer. Anchor Steam Beer™ was the founder of this unique style.

For more information, see the [Recommended Reading section](#).

### **YEAST STARTER:**

Liquid yeast must be and all yeast should be, pitched to a Starter before pitching to the beer in the fermenter. Using a starter gives yeast a head start and prevents weak fermentations from under-pitching. Dry Yeast should be re-hydrated before pitching. Re-hydrating dry yeast is simple.

1. Put 1 cup of warm (90F, 35C) boiled water into a sterile jar and stir in the yeast. Cover with Saran Wrap and wait 10 minutes.
2. Stir in one teaspoon of sugar.
3. Cover and place in a warm area out of direct sunlight.
4. After 30 minutes or so, the yeast should be actively churning and foaming. This is now ready to pitch.

Liquid yeast is regarded as superior to Dry yeast because of the refinement of yeast strains present and little risk of bacterial contamination during manufacture. Liquid yeast allows for greater tailoring of the beer to a particular style. However, the amount of yeast in a liquid packet is much less than the amount in the dry. For best results, it needs a starter. The packet must be squeezed and warmed to 80F at least two days before brewing. One day before, it should be pitched to a wort starter made from 1/4 cup of DME and a pint of water that has been boiled and cooled to 75F (25C). Adding a quarter teaspoon of yeast nutrient is also advisable. Let this sit in the same warm place until brewing time the next day. Some foaming or an increase in the white yeast layer on the bottom should be evident. The Starter process may be repeated to provide even more yeast to the wort to insure a strong fermentation.