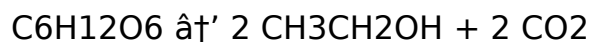


# The process of brewing beer

[Food & Diet](#)



Beer is the world's ancient and most generally consumed alcoholic beverage and the third most popular drink overall after water and tea. 'The word beer comes from the Latin word *bibere*, meaning "to drink".' It is produced by the brewing and fermentation of starches, mainly derived from cereal grains predominantly malted barley, although wheat, maize (corn), and rice are widely used. Maximum beer is flavored with hops, which enhance bitterness and also acts as a natural preservative, nevertheless other flavorings such as herbs or fruit may rarely be included. The chemical equation beneath sum up to form beer:



## History

The history of beer making is a story of creation, dedication and honor. While wine making is a very old art that probably invented with the Phoenicians some 2,600 years ago, the art of beer making is said to be older than that of farming. Around 10,000 and 15,000 years ago, women were known to collect wild grain and utilize it to make beer by fermentation which would depend on spontaneous air-borne yeast.

Along the birth of civilization correspondingly originated the skilled beer brewing. The Sumerians in around 6,000 years old developed different varieties by soaking barley bread in water. Around 4000 years ago seal, of a Goddess of brewing "Hymn to Ninkasi" was found in Sumerian's period. In which "hymn" is also a process for making beer. The Babylonians around 2000 years later brought forth several further varieties. Babylonians also distributed and exported the beer and above all, there were laws on the

beer. For example the king used to decide the quantity of beer that a person can consume. Beer in that was also sold on barter system. After Babylonians, Egyptians carried on the custom of beer brewing. They also developed many different varieties of beer by adding dates and other fruits. Greeks and Romans carried the tradition of beer brewing as the capture on the Egyptians. In Roman Empire beer was drank in some parts where there was no wine available. Beer of that time could not be stored and there was no yeast introduced yet. As the culture of barley spread in in north and west, the beer brewing also grabbed attention. After that period, slowly beer brewing reached the entire world and also developed because of trade, wars, and modernization of world.

#### Process of beer brewing

The simplest way to describe the process of beer making is fermentation of Malted barley, hops, water and yeast. But sometimes to give beer a specific flavor, ingredients like wheat, maize (corn), rice, fruit, dry fruit and spices are introduced and this dependence on the region where the beer is produced.

If the process is considered in detail beer brewing has different stages like malting, milling, mashing, brewing, cooling, fermentation which is followed by maturation, filtering (finishing) and packaging.

#### What is barley?

Barley is a towering grass and on the top of the stalk it has got seeds. Barley is not used for baking because it does not form good dough nevertheless it is

good for brewing beer. Barley is available numerous strains and ranges that eventually influence the flavor of the beer.

### Malting

Malting is the first step of beer making. In this process barley is prepared to be used in brewing. Barley cannot be used directly to produce the wort since the starch in its floury kernels is insoluble. As the process of malting progresses it exposes the starches present in the barley. The first step is Steeping in malting in which grain is soaked in a barrel of water for approximately 40 hours. The second step is germination of the barley grain and for the grain to germinate it is spread on the flat surface in the sprouting room for roughly three to five days where the formation of rootlets is instigated. The germination process produces the enzymes by breaking down. At the end of the process, the starch becomes soft but the enzymes are not in progress of transforming the starch into sugar. Now the barley grain is known as green malt.

### Kilning

The next process is kilning. Germination is stopped by drying the green malt on metal shelves in the oven (kiln house) at 50° C. The temperature is then raised up to 85°C to make a light malt, or more upper for a dark malt. It is essential that temperature should be raised slowly for the reason that the enzymes in the grain are not ruined. The malted shoots are separated and then dried malts are stored in grain storage. Even though malted barley is the chief ingredient, unmalted corn, rice or wheat are added sometimes, to create diverse beer flavors in this malting process. At the end of kilning, the <https://assignbuster.com/the-process-of-brewing-beer/>

product obtained malt. The flavor, color and aroma of the beer would be different as there are variations in the ways of malting the barley.

### Milling

Next process is milling and as the name suggest it is the cracking of the grain which the brewer chooses for the particular batch of beer. Milling the grain allows it to absorb the water which would eventually be mixed in order to let water to extract sugars from the malt.

### Mashing

The following step to milling is Mashing. Mashing is the process of making the finest ground malt into a sweet syrupy fluid. Mashing transforms the starches into sugars that can be fermented and which are released throughout the malting period. The milled grains are released into warm water then are slowly heated to about 75° C in a big cooking container so called as mash tun. In this mash tun, the grain and heated water forms a cereal mash which dissolves the starch into the water, converting it into sugar mostly maltose. Water itself is a key ingredient in beer because water is an important part of the brewing process. This water which contains sugar is then strained through the bottom of the mash and is now entitled as wert.

### Brewing

Brewing is one of the most an important process in beer making. The finished grains are drained out and wert are ready for boiling and this consist of several technical and chemical reactions. During this stage, vital judgments are made for the flavor, color and aroma of the beer. Different <https://assignbuster.com/the-process-of-brewing-beer/>

kinds of hops are added at different times throughout the boil process for either bitterness or aroma and also for preserve it. The wort is boiled for 1 or 2 hours to sterilize and concentrate it and extract the necessary essence from the hops.

### Cooling

Cooling is the next step. The wort is shifted quickly from the brew kettle to filter out the hops through a method, and then it is taken to a heat exchanger for cooled. It is essential to rapidly cool wort to a point where yeast can be securely added, as yeast doesn't grow in high heat.

### Fermentation

Fermentation is a vital step in brewing. “ The brewer now selects a type of yeast and adds it to the fermentation tank. This is where the “ real magic” of brewing happens when the yeast, eats the sugar in the wort and turns it into alcohol and carbon dioxide.” This process takes ten days. The wort finally becomes beer.

### Maturation

Maturation which is also known as racking. The beer has now been brewed, but it can still be improved through maturation. Throughout this stage, the brewer transfers and shelves the beer into a new tank known as the conditioning tank. The brewer then just waits for the beer aging process to complete and thus its flavor also ripens. The liquid clarifies as yeast and other particles settle. Secondary fermentation saturates the beer with carbon dioxide.

<https://assignbuster.com/the-process-of-brewing-beer/>

## Finishing

Finishing is the end of the brewing process. Here the beer is filtered and carbonated. Additional filtering contributes to the sparkling clarity of beer. The beer is transferred to a holding tank where it is kept until it is bottled, canned or put into kegs. Filling systems ensure that air does not come into contact with the beer and is not trapped inside the container.

## Chemistry of beer

What are the different flavors and colors of beer and from where do they get them?

There are many forms of malts. This includes pale malts which are dried at a low temperature. Therefore it produces a malt that gives the beer a pale golden color and a slightly bread-like flavor such as a pilsner. (PILSENER: A pale lager with strong flavor of hops; first brewed in the Bohemian town of Pilsen.). Mild ale malts are kilned to a bit higher temperature which produces a pale malt that gives the beer a deeper color and slightly toasted biscuit flavors. Many English ales go for this malt process. Vienna and Munich malts are simmered and lightly kilned thus helps some of the starch to convert more sugar which gives the beer an orangey amber color and the classic toffee taste, furthermore nutty flavors of Oktoberfest beer and other Bavarian, German specialties. The highest temperatures are used to acquire very flavorful and aromatic malts. Caramel and Crystal malts are slowly boiled until all of their starches are converted into sugars then they are kilned until they caramelize and this caramel flavored malt gives the beer a reddish-amber color, rich flavors. Kiln the barley longer and at higher temperatures

<https://assignbuster.com/the-process-of-brewing-beer/>

and the darker and “roastier” the beer will be. Just like higher roasted coffee beans. This will give the beer darker color and chocolate, coffee and espresso-like flavors.

What does yeast do in beer?

Each brewery has its own strains of yeast, and it is these that largely determine the character of the beer. In some yeast varieties, the cells rise to the top at the end of fermentation, and are then skimmed off. This is called top fermentation, and ales are brewed in this way. When at the end of fermentation the yeast cells sink to the bottom, the process is known as bottom fermentation, used for lager or pils. When ales are brewed yeast commonly used is known as *Saccharomyces cerevisia* and for lager and pils *Saccharomyces calbergensis*. Some special Belgian beers use a third method where fermentation relies on spontaneous action by airborne yeasts.

Alcohol percentages of beer worldwide

Alcohol percentages vary by country to country. As British ale beer contains average alcohol about 4.4% whereas Belgian beers tend to have average alcohol of about 8%. In India there are 3 common types of beer which include lager beer which consist of around 4% of alcohol, about 8% is premium beer and super strong beer consist of about 15%. The strongest beer sold in Britain was Dogfish Head's which had 21% alcohol in 2003. In Japan in 2005, the Hakusekikan Beer Restaurant sold an eisbock, believed that it had 28% alcohol. The strongest beers sold in 2009 Scotland's Brew Dog Brewing released Tactical Nuclear Penguin, claiming the title of world's strongest beer at which had 32%. Recently for Brew Dog, Schorschbräu <https://assignbuster.com/the-process-of-brewing-beer/>



Brewing from Germany released Schorschbock in January 2010 which consists of about 40% alcohol.

### Infected beer

The diacetyl, light struck, oxidation, esters, phenols, over or under carbonation, acidic are some infection that beer can get. Diacetyl is instigated when there is not sufficient oxygen in wort and high temperature initial fermentation. Light struck is affect the beer when the beer is exposed to light. When air is bonded with beer oxidation takes place and the beer is spoiled which gives the beer a cardboard or paper smell. When Banana, apple flavor comes from beer the beer is affected by esters. Over or under carbonation is caused when the bottles are not sealed properly moreover this can also happen when the yeast added to the beer is wild. When bacteria's like lactobacillus and bacillus attack the beer the beer is infected and this is seen when the beer gets acidic.

### Conclusion