The process of making beer is known as brewing. A dedicated building for the making of beer is called a brewery, though beer can be made in the home and has been for much of its history. A company that makes beer is called either a brewery or a brewing company. Beer made on a domestic scale for non-commercial reasons is classified as home brewing regardless of where it is made, though most homebrewed beer is made in the home. Brewing beer is subject to legislation and taxation in developed countries, which from the late 19th century largely restricted brewing to a commercial operation only.

The purpose of brewing is to convert a starch source into a sugary liquid called wort and to convert the wort through the fermentation process effected by yeast into the alcoholic beverage known as BEER. There are several steps in the brewing process, which include malting, milling, mashing, lautering, boiling, fermenting, conditioning, filtering, and packaging. There are three main fermentation methods, warm, cool and wild or spontaneous. Fermentation may take place in open or closed vessels. There may be a secondary fermentation that can take place in the brewery, in the cask, or in the bottle.

The wort is prepared by mixing the starch source (normally malted barley) with hot water, is known as "mashing". Hot water (known as "liquor" in brewing terms) is mixed with crushed malt or malts (known as "grist") in a mash tun. The mashing process takes around 1 to 2 hours, during which the starches are converted to sugars, and then the sweet wort is drained off the grains. The grains are now washed in a process known as "sparging". This washing allows the brewer to gather as much of the fermentable liquid from the grains as possible. The process of filtering the spent grain from the wort and sparge water is called wort separation. The traditional process for wort separation is lautering, in which the grain bed itself serves as the filter medium. Some modern breweries prefer the use of filter frames which allow a more finely ground grist. Most modern breweries use a continuous sparge, collecting the original wort and the sparge water together. However, it is possible to collect a second or even third wash with the not quite spent grains as separate batches. Each run would produce weaker wort and thus a weaker beer. This process is known as second (and third) runnings. Brewing with several runnings is called parti-gyle brewing.

The sweet wort collected from sparging is put into a kettle, or "copper", (so called because these vessels were traditionally made from copper) and boiled, usually for about one hour. During boiling, water in the wort evaporates, but the sugars and other components of the wort remain; this allows more efficient use of the starch sources in the beer. Boiling also destroys any remaining enzymes left over from the mashing stage. Hops are added during boiling as a source of bitterness, flavor and aroma. Hops may be added at more than one point during the boil. The longer the hops are boiled, the more bitterness they contribute, but the less hop flavor and aroma remains in the beer.
After boiling, the hopped wort is now cooled, ready for the yeast. In some breweries, the hopped wort may pass through a hopback, which is a small vat filled with hops, to add aromatic hop flavoring and to act as a filter; but usually the hopped wort is simply cooled for the fermenter, where the yeast is added. During fermentation, the wort becomes beer in a process where the yeast converts sugar into alcohol and carbon dioxide. This requires a week to months depending on the type of yeast and strength of the beer. In addition to producing alcohol, fine particulate matter suspended in the wort settles during fermentation. Once fermentation is complete, the yeast also settles, leaving the beer clear.

Fermentation is sometimes carried out in two stages, primary and secondary. Once most of the alcohol has been produced during primary fermentation, the beer is transferred to a new vessel and allowed a period of secondary fermentation. Secondary fermentation is used when the beer requires long storage before packaging or greater clarity. When the beer has fermented, it is packaged either into casks for cask ale or kegs, aluminum cans, or bottles for other sorts of beer.

**INGREDIENTS**

The basic ingredients of beer are water; a starch source, such as malted barley, able to be saccharified (converted to sugars) then fermented (converted into alcohol and carbon dioxide); a brewer’s yeast to produce the fermentation; and a flavorings such as hops. A mixture of starch sources may be used, with a secondary starch source, such as maize (corn), rice or sugar, often being termed an adjunct, especially when used as a lower-cost substitute for malted barley. Less widely used starch sources include millet, sorghum and cassava root in Africa, and potato in Brazil, and agave in Mexico, among others. The amount of each starch source in a beer recipe is collectively called the grain bill.

**Water**

Beer is composed mostly of water. Regions have water with different mineral components; as a result, different regions were originally better suited to making certain types of beer, thus giving them a regional character. For example, Dublin has hard water well-suited to making stout, such as Guinness; while the Plzeň Region has soft water well-suited to making Pilsner (pale lager), such as Pilsner Urquell. The waters of Burton in England contain gypsum, which benefits making pale ale to such a degree that brewers of pale ales will add gypsum to the local water in a process known as Burtonisation.

> Water, a starch source (barley), yeast and hops are the necessary components for making beer.

**Starch source**

Malted barley before roasting

The starch source in a beer provides the fermentable material and is a key determinant of the strength and flavor of the beer. The most common starch source used in beer is malted grain. Grain is malted by soaking it in water, allowing it to begin germination, and then drying the partially germinated grain in a kiln. Malting grain produces enzymes that convert starches in the grain into fermentable sugars.[17] Different roasting times and temperatures are used to produce different colors of malt from the same grain. Darker malts will produce darker beers.[18]
Nearly all beer includes barley malt as the majority of the starch. This is because its fibrous hull remains attached to the grain during threshing. After malting, barley is milled, which finally removes the hull, breaking it into large pieces. These pieces remain with the grain during the mash, and act as a filter bed during lautering, when sweet wort is separated from insoluble grain material. Other malted and unmalted grains (including wheat, rice, oats, and rye, and less frequently, corn and sorghum) may be used. In recent years, a few brewers have produced gluten-free beer, made with sorghum with no barley malt, for those who cannot consume gluten-containing grains like wheat, barley, and rye.

Yeast

Yeast is the microorganism that is responsible for fermentation in beer. Yeast metabolizes the sugars extracted from grains, which produces alcohol and carbon dioxide, and thereby turns wort into beer. In addition to fermenting the beer, yeast influences the character and flavor. The dominant types of yeast used to make beer are the top-fermenting Saccharomyces cerevisiae, which would typically be used to produce ales, and bottom-fermenting Saccharomyces uvarum, which typically be used to produce lagers. Brettanomyces ferments lambics, and Torulaspora delbrueckii ferments Bavarian weissbier. Before the role of yeast in fermentation was understood, fermentation involved wild or airborne yeasts. A few styles such as lambics rely on this method today, but most modern fermentation adds pure yeast cultures.

Hops

Flavoring beer is the sole major commercial use of hops. The flower of the hop vine is used as a flavoring and preservative agent in nearly all beer made today. The flowers themselves are often called "hops".

The first historical mention of the use of hops in beer was from 822 AD in monastery rules written by Adalhard the Elder, also known as Adalard of Corbie, though the date normally given for widespread cultivation of hops for use in beer is the thirteenth century. Before the thirteenth century, and until the sixteenth century, during which hops took over as the dominant flavorings, beer was flavored with other plants; for instance, Glechoma hederacea. Combinations of various aromatic herbs, berries, and even ingredients like wormwood would be combined into a mixture known as gruit and used as hops are now used. Some beers today, such as Fraoch' by the Scottish Heather Ales Company and Cervoise Lancelot by the French Brasserie-Lancelot company, use plants other than hops for flavoring.

Hops contain several characteristics that brewers desire in beer. Hops contribute a bitterness that balances the sweetness of the malt; the bitterness of beers is measured on the International Bitterness Units scale. Hops contribute floral, citrus, and herbal aromas and flavors to beer. Hops have an antibiotic effect that favors the activity of brewer's yeast over less desirable microorganisms and aids in "head retention", the length of time that a foamy head created by carbonation will last. The acidity of hops is a preservative.
Clarifying agent
Prior to packaging some brewers choose to add one or more clarifying agents to beer, which typically precipitate (collect as a solid) out of the beer along with protein solids and are found only in trace amounts in the finished product. This process makes the beer appear bright and clean, rather than the cloudy appearance of ethnic and older styles of beer such as wheat beers.

Examples of clarifying agents include isinglass, obtained from swimbladders of fish; Irish moss, a seaweed; kappa carrageenan, from the seaweed Kappaphycus cottonii; Polyclar (artificial); and gelatin. If a beer is marked "suitable for Vegans", it was clarified either with seaweed or with artificial agents.

Production and trade around the World
The Benedictine Weihenstephan Brewery in Bavaria, Germany, can trace its roots to the year 768, as a document from that year refers to a hop garden in the area paying a tithe to the monastery. The brewery was licensed by the City of Freising in 1040, and therefore is the oldest working brewery in the world. The brewing industry is a global business, consisting of several dominant multinational companies and many thousands of smaller producers ranging from brewpubs to regional breweries. More than 133 billion liters (35 billion gallons) are sold per year—producing total global revenues of $294.5 billion (£147.7 billion) as of 2006.

A microbrewery, or craft brewery, is a modern brewery which produces a limited amount of beer. In the US, the American Brewers Association defines a "craft brewery" as "small, independent and traditional", and gives a production size of less than 6,000,000 US beer barrels (700,000,000 L) a year and cannot be more than 24% owned by another alcoholic beverage company that is not itself a craft brewery (This means Goose Island and other breweries like it are no longer craft breweries due to ownership by MillerCoors or AB InBev) A brewpub is a type of microbrewery that incorporates a pub or other eating establishment.

SABMiller became the largest brewing company in the world when it acquired Royal Grolsch, brewer of Dutch premium beer brand Grolsch. InBev was the second-largest beer-producing company in the world and Anheuser-Busch held the third spot, but after the acquisition of Anheuser-Busch by InBev, the new Anheuser-Busch InBev company is currently the largest brewer in the world. Brewing at home is subject to regulation and prohibition in many countries. Restrictions on homebrewing were lifted in the UK in 1963, Australia followed suit in 1972, and the USA in 1978, though individual states were allowed to pass their own laws limiting production.

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