Brewing Process

Brewing Process

Much like a fine chef who takes a number of fine ingredients and blends them together to produce a culinary delight, the MillerCoors brew-masters take many natural brewing ingredients to brew each of our distinctive beers.

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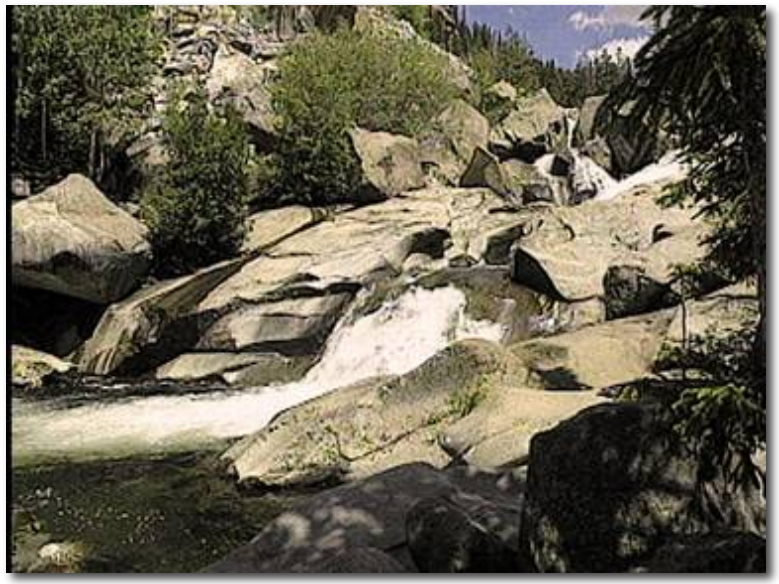
Ingredients of Beer - Water

Water:

Beer is 87% to 98% water depending on the beer type and alcohol content. Water is not only the medium used to brew the ingredients, but also a contributor to the smooth flavor characteristics of the beer.



The flavor characteristics contributed by the water are derived from the mineral content in the water itself.

The water MillerCoors uses in the brewing process is first filtered then purified.

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Ingredients of Beer - Barley

Barley:

Bill Coors has often been quoted, *"Barley is to beer as grapes are to wine."*

It isn't beer if it doesn't have barley. Barley is the most important solid ingredient in beer and is one of the main contributors to the body, aroma, flavor and color of each beer.

Barley malt is considered the "heart" of beer.

Special strains of barley have been developed for use in brewing beer that assure the consistency, quality, and taste in each of our beers.

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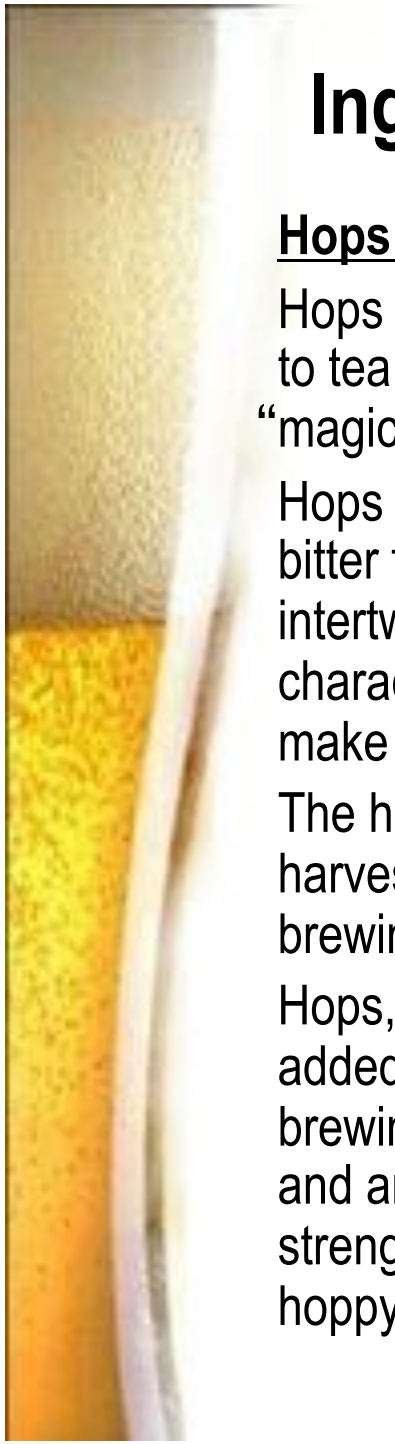


Ingredients of Beer - Hops

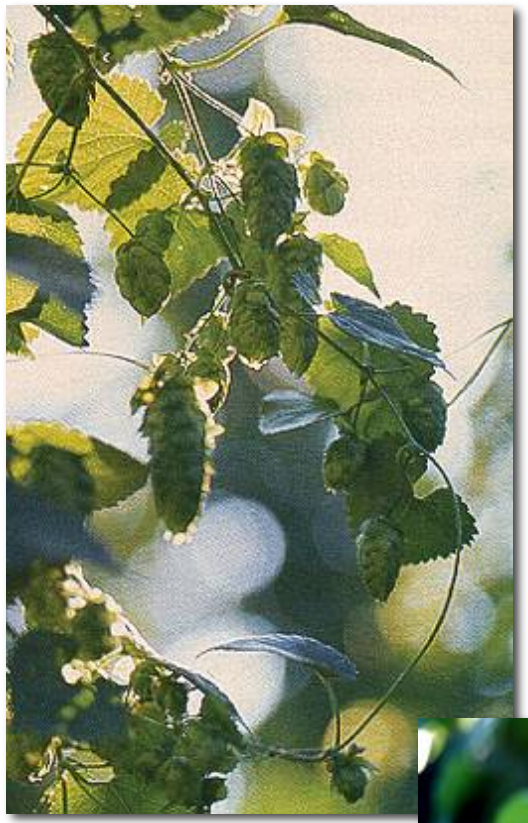
Hops:

Hops are to beer as tea leaves are to tea; hops are considered the "magic" of beer making

Hops impart a distinctive yet subtle bitter flavor and aroma that intertwines with the flavor characteristics of the barley malt to make each beer unique

The hop cones, or flowers, are harvested, dried and used for brewing

Hops, domestic and/or foreign, are added at various times in the brewing process. The type of hop and amount used determine the strength and "uniqueness" of the hoppy flavor in a beer



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Ingredients of Beer - Cereal Grains

Cereal Grains:

Very few beers use barley as the only brewing grain. When only barley is used in the beer, the beer is very filling, bold and robust.

To temper the robust flavor other cereal grains such as rice, corn, wheat, and oats may be called for in the recipes of various beers.

Cereal grains give the beer a lighter, smoother, refreshing body, and improved drinkability.

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Ingredients of Beer - Flavorings

Flavorings:

Many beers have additional flavorings added to give the brew different taste characteristics

Flavorings range from the common, such as honey, coriander, and brown sugar, to more exotic flavorings such as hibiscus, Kieffer lime, pumpkin, and elderberries to name a few

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The Brewing Process

The selection and blend of the ingredients provide the base of a beer. It is the brewing process that takes these ingredients and transforms them into beer.

Barley malt and cereal grains contain starches. Through the brewing process these starches are converted into fermentable sugars by the enzymes in the malt

The brewing process consists of four basic steps: Malting, Brewing, Fermenting and Aging

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The Brewing Process - Malting

Step One: Malting

The barley, prior to its going into the brew kettle, must go through a process called malting to prepare it for the brewing process by increasing the enzyme levels. There are three basics parts to the malting process:

Part One: Steeping

Part Two: Germination

Part Three: Kilning

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The Brewing Process - Malting (cont'd)

Malting (cont'd)

Part One: Steeping

Here the barley is cleaned and soaked as the barley seed absorbs moisture in preparation for germination.

Part Two: Germination

The water soaked barley seeds are placed in large bins in environmentally controlled rooms with temperatures of approximately 50^{o} F and a humidity of 100%. Here, the barley is actually allowed to begin to grow.

The growth process causes the barley to begin to convert its raw natural starches and enzymes into brewable starches and enzymes in preparation for brewing. Germination lasts up to six days.

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The Brewing Process - Malting (cont'd)

Malting (cont'd)

Part Three: Kilning

The germinated barley is moved into large furnace type rooms where the barley is dried and roasted, thus stopping the growth.

Kilning takes up to fourteen hours and has a direct impact on the color of the barley. The different kilning times and temperatures of select brewing barleys will produce different colored malt.

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The Brewing Process - Brewing

Step 2: Brewing:

The barley and cereal grain adjuncts are added to the brewing water in the brewing kettles where they are boiled and their starches are converted into fermentable sugars by the malt enzymes.

The selected hops and/or flavorings will also be added during the brewing process.

Once brewed, the resultant liquid produced is called wort. The wort is removed from the brew kettle and any grain and hop solids are removed. The wort is then cooled and transferred to fermenter tanks.

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The Brewing Process - Fermenting

Step 3: <u>Fermenting:</u>

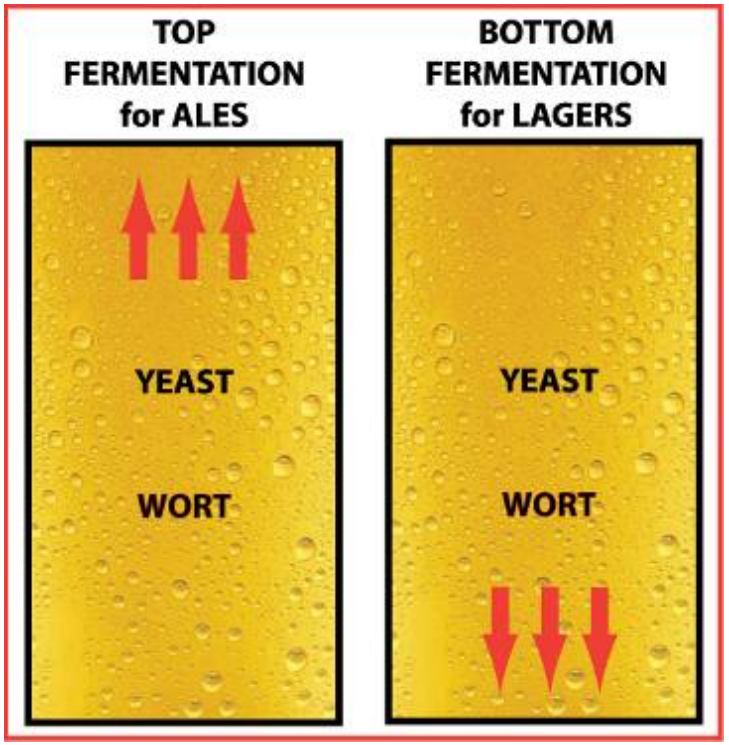
Once the wort has cooled, yeast is then added to the brew to consume the sugars and act as a catalyst to produce :

CO_2

Alcohol

as well as "The beer itself"

There are two basic types of beers: ales and lagers. The yeast used during the fermentation process, and the temperature at which the wort is fermented, determine the type of beer being produced.



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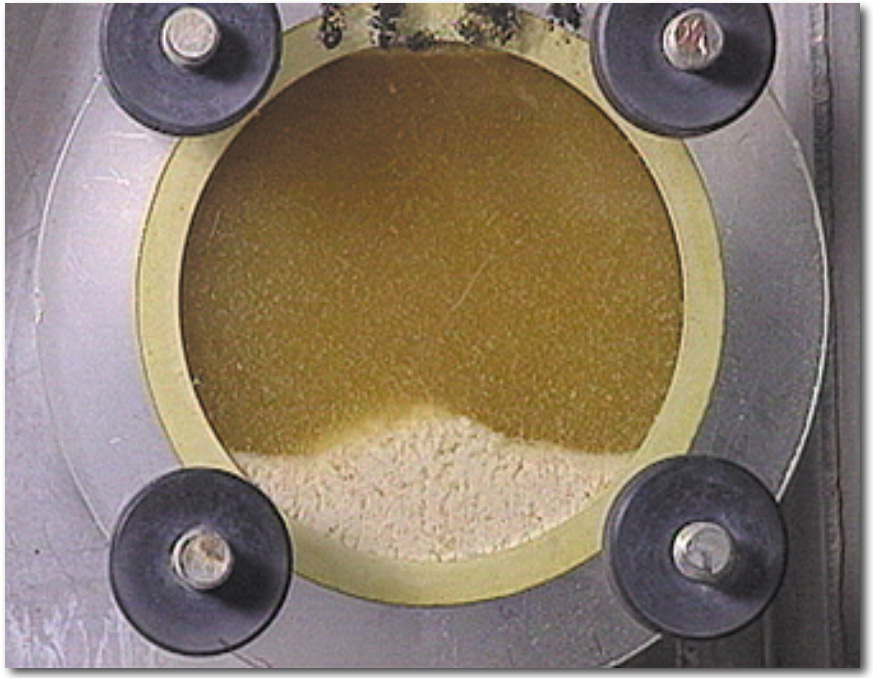
The Brewing Process - Fermenting (cont'd)

Step 3: Fermenting (cont'd)

Ale is the generic name for beers produced by top fermentation. Ales are typically fermented at a higher temperature than lagers, anywhere between 60° to 70° F. Ales tend to have a more robust flavor and deeper hues than lagers; however they can also be pale and light. Porters, stouts and bitters are examples of ales.



Lager is a German verb meaning "to store" and has come to be the generic term for any beer produced by bottom fermentation.

Lagers are typically fermented at a lower temperature than ales, anywhere between 50° to 60° F. Most lagers are Pilsner beers. Pilsner beers are paler, more yellow in color, thicker foam, hoppier, crisper, and drier than ales. Lagers, though, can also be strong dark beers, such as a "festive" bock or Oktoberfest.

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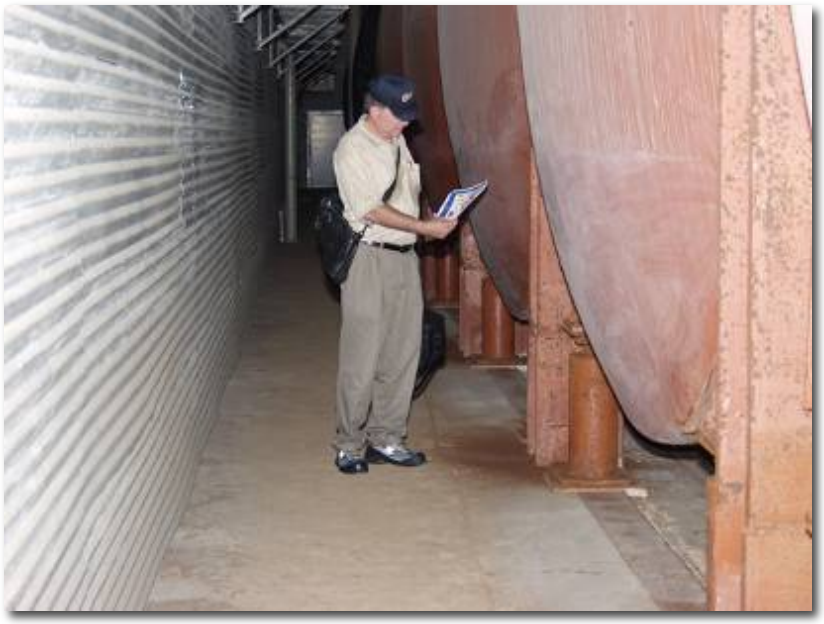
The Brewing Process - Aging

Step 4 : Aging:

After the fermentation process, the beer is transferred to aging tanks where many of the byproducts and solids of the fermentation process precipitate out of the beer, and the beer is allowed to mellow and mature in flavor.

Lagers are usually aged cool or cold for 4 to 8 weeks. The longer the beer is aged, the smoother the finished beer will be. Ales on the other hand generally require a shorter aging time and are best-packaged young.



Aging is the final step in the brewing process. After the brewing process is complete, the beer is packaged and sent out to our distributors.

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