

# 21 Fun Beer Facts

## From Wayne's World

Educated craft beer enthusiasts are smart enough to ask questions about their beer. Here are answers to educated questions often asked about beer and brewing.

## **#1. ABV.**

What is ABV? ABV (Alcohol By Volume) is one way of measuring the amount of Alcohol in a beer.

A beer with 4% ABV is 4% Alcohol and 96% other components - mostly water.

As a rule of thumb, most beers are around 4% to 5% ABV so that you can enjoy a few pints without falling off the chair.

Generally, beers under 4% are called Session Beers so that you can consume multiple beers in a single session without embarrassing yourself.

Beer from Mega-breweries in brown bottles are usually around 5% ABV, which allows you to enjoy a few during the evening and go to work the next morning.

Craft beer gravitates around 6% to 8% ABV, partly to distinguish craft beer from competitors and because alcohol provides flavor to beer. The downside is that 16 ounces of 8% ABV beer means that you are limited to only drinking a few beers at a time.

Beers over 9% ABV, are intended for aging and special occasions. These beers are intended to be consumed in small quantities, with friends.

Barley wine can be in the range of 13% to 18% ABV and should be enjoyed in small glasses, just as you would enjoy a port wine or sherry.

For perspective, white wine is typically around 11% ABV and red wines are typically around 14% ABV. This ABV range has proven to be the best range for white wines to be served with white meat such as fish or chicken, and not overpower the food. Red wines are often enjoyed with red meat and need to be in the 14% ABV range to stand up to the rich flavors and fats of red meat.

## #2. IPA.

IPA stands for India Pale Ale. Although the IPA legend tells of beers that were highly hopped to make the six month long journey from England to India over rough seas to quench thirsts of British colonists in the 1800's, this legend is only loosely based on reality.

The facts which gave rise to this legend are:

1. Beer requires temperatures around 60 to 70 degrees to ferment correctly.
2. The climate in India is too hot and humid for most of the year to obtain clean beer fermentations.
3. Brewers in England produced strong beer, and shipped it to India.
4. The quality of beer which arrived in India varied widely and was priced for sale based on the quality and grade.
5. More hops were added to the beer, upon arrival in India to cover up off flavors.
6. Much of the beer shipped to India was dark beer, with high alcohol and hops. Most likely, the Pale Ale we think of today as IPA, was never available to the thirsty colonists in India. Beer was not limited to pale ales. The bulk of beer shipped to India was dark porters because it was easier to make dark beers than light beers at this time in history.

7. Beer (just like most food and spices at the time) was shipped in wooden barrels. Wooden barrels are inherently problematic for beer because they harbor bacteria. Therefore, no amount of hops would prevent some bacteria from infecting a beer on the hot journey to India.

You are now educated to probe a bit deeper the next time a beer geek subjects you to his "wisdom" of the origins of IPA legend.

Recommended Books on the topic:

Mitch Steele: IPA

Hops and Glory by Pete Brown (Also on audiobook)

### **#3. Hops.**

The first word that comes to mind when hops are mentioned, is "Citrusy", because citrusy hops feature prominently in current IPA's.

"Citrusy" aroma is merely an ancillary benefit that hops give to beer. The main reasons hops are added to beer are:

1. Bitterness. Yes, I realize that some consumers don't enjoy bitter beer, but the truth is that beer without bitterness is unpalatably sweet and nobody can drink more than a few mouthfuls of the sugary sweetness. Over the ages brewers have tried various ingredients to provide bitterness as a counterpoint to the sweetness in beer, and hops have come up as the winner after all others were eliminated.
2. Preservatives. Hops has anti-bacterial properties. Sweet sugar water (like beer) is a great place for Bacteria to thrive. Bacteria eat up the sugars, create acid, and off flavors. Hop oils prevent this and are the ultimate party-pooper for bacteria.
3. Hops can be used for other purposes such as medicinal use as anti-inflammatory and to treat

insomnia, although these purposes are not pursued on a large scale, commercially.

4. Although the main distinguishing fact of hops comes from its variety (Such as Cascade versus Saaz), hops do provide a small amount of "Terroir" to a beer. There is a distinguishing difference between Cascades grown on Merry Hill Farm versus Cascades grown in Yakima Valley, but the difference will not be detected or distinguishable at face value.

## **#4. IBU.**

IBU = International Bitterness Units. Although the absolute value can be determined in a laboratory, the application of this knowledge is limited.

For example, when a beer is tested in a lab, and has a value of "30 IBU", one would expect this to be a medium hopped beer. However, if the beer is a light lager, then 30 IBU's will give you a perception of an overly bitter beer .

30 IBU's in a Double IPA will taste as if the beer isn't bitter enough and 30 IBU's in a Saison will be completely out of place for the style and ruin your experience of the beer.

Although IBU is one scientific measure of a beer, the educated consumer realizes that each beer is a holistic experience and IBU is but one aspect of the holistic experience.



## **#5. Beer Color.**

Beer color is measured in SRM. (Standard Reference Method) SRM was adopted by the American Society of Brewing Chemists in 1951.

Although consumers mistakenly imply beer attributes based on color, there is no correlation between beer color and other attributes.

For example, some consumers say "I don't like dark beers because they are too strong." The fact is that beer color is an independent variable and does not correlate to beer strength or flavor.

Culture also plays a role. In New England, consumers tend to associate beer color with seasons. During Winter months, consumers look for dark beers, such as milk stout. During Spring months, consumers look for lighter beers that elevate the spirits and remind us that Summer is coming. During hot and humid Summers, we want a light colored and low Alcohol beer that can be easily consumed in quantity. In Fall we tend to think of beer colors that blend with the Fall Foliage, which pair with Oktoberfest colors of dark amber and reddish hues. During Christmas season, we want dark beers with a slight hint of Holiday spices.

Some breweries specifically play tricks on the minds of consumers by making a traditional beer with a different color. For example, when everyone expects a Stout to be dark, a "White Coffee Stout" with a Pale color but taste of a coffee stout just twists your mind.

The question is "Why measure beer color?" and the answer is that beer scientists measure beer color simply as a data point.

One use of beer color is that beer gets darker when it oxidizes. A Pale Ale at 4 SRM will increase to 9 SRM as it ages and oxidizes.

Another reason to measure beer color is to confirm that the beer is within specification.

For example, if a brewery has a Pale Ale as a flagship brand, with a color of 3 SRM, then consumers expect each can of beer to be within specification. Consumers will be confused if this week's can of beer is 19 SRM.

The only way to accurately measure beer color is in a controlled laboratory setting. There are inherent problems with field tests that attempt to measure beer color because the measurements are so close together and lighting plays a big factor. For example, a beer of 1 SRM can easily be mis-

classified as 3 SRM in poor lighting and just by changing the background of the test sample.

In summary, beer color is most important to the QA department in a brewery than a consumer.

Consumers should not attribute anything to beer color, other than an imperfect attempt to measure the color of a beer.

## **#6. Lager versus Ale.**

Educated consumers often ask "What is the difference between a Lager versus an Ale?"

The difference is that Lager yeasts ferments best around 55 Degrees Fahrenheit while Ale yeasts ferment best about 10 degrees warmer.

The fermentation temperature is important to brewers. However, the distinguishing differences for consumers is that Lager yeasts typically ferment cleanly, leaving a crisp taste in the beer, which makes it easy to consume such as a pilsner lager during summer time cookouts.

In contrast, Ale yeasts can provide a broader range of potential flavors. When fermented on the colder end of the fermentation spectrum, Ale yeasts can yield a beer as clean as a lager yeast. As the fermentation temperature is increased, Ale yeasts provide more flavor and character which are welcome in IPA but not welcome in Pilsner.

## **#7. "Those were the good old Ales."**

Media frequently entices brewers and consumers to romanticize historical beer. You see news articles about a beer salvaged from an ocean floor after 177 years, dissected, and then recreated as a "Historical beer lost through the ages, but now rediscovered". Similarly, beer archeologists have discovered that the world's oldest known beer recipe of about 6,000 years, comes from Ancient Mesopotamia.

The reality isn't nearly as romantic. Beer is a product fermented by yeast. Beer is relatively fragile and susceptible to micro-organism spoilage at many phases of its journey from the brewery to your mouth. Every bacteria in the world is constantly looking for a food source, and your beer is a food paradise for bacteria.

In "the good old days", beer was fermented in open containers, with multiple wild yeast strains and bacteria and no preservatives.

This means that each batch of beer was in a race against time - "How much will it spoil before you drink it?"

In ancient cultures, beer had a shelf life of a few days before it became undrinkable. In the middle

ages, hops were used in Europe which increased shelf-life to a few weeks.

Until mechanical refrigeration was used commercially from the 1860's, beer was stored at room temperature. This means beer had shelf life of a few weeks to a few months during the winter, and a few days during hot summer months.

In summary, historical beers sound romantic, but actually, today's beer is better than any historical beer. This is the best time in all of history to enjoy great beer because today we have the greatest amount of beer science knowledge from all of history.

## **#8. GodisGood?**

From around 6,000 BC to about 1860 AD, brewers worked on empirical data more than science. A brewer (male or female, depending on the prevailing culture) would make beer the same way that their predecessor had made it, and sometimes it fermented nicely, and other times the beer spoiled. Nobody knew why this happened and brewers came to the conclusion that fermentation is mystical.

One variable that increased the probability of a successful batch of beer, was a brewers stick. A brewer would stir the beer with the special stick and beer would start fermenting.

Brewers did not know that they were essentially harvesting and culturing yeast colonies for each fermentation. Given that healthy fermentation leads to euphoric feelings for consumers, the fermentation became known as GodisGood.

## #9. Milk or Beer?

In 1859 Dr. Louis Pasteur confirmed that microorganisms like yeast create fermentation.

This seems so simple to microbiologists today, where we can put a sample under a microscope to magnify the image and then see organisms moving around. But, in 1850, leading scientists believed in spontaneous generation which holds that living creatures can arise from nonliving matter. For instance, it was hypothesized that fleas could arise from inanimate matter such as dust.

In 1859, Dr. Pasteur performed experiments that showed that without contamination, microorganisms could not develop. This led to pasteurization techniques to preserve milk, but more importantly, helped brewers expand and refine our body of knowledge around beer science and fermentation. Who needs milk when you can have beer?



## **#10. Beer and Tax.**

All through history tax collectors have turned to alcohol to fill state coffers. There are many examples of "cat and mouse" games where tax collectors refocus efforts to squeeze another drop of blood from the poor brewer and wily brewers burn the midnight oil to uncover yet another loophole that minimizes the effect of the latest tax law.

For example, tax laws have ranged over the ages from taxing raw ingredients (which brewers then avoided by using different ingredients) to taxing the size of the mash tun (which brewers then avoided by reusing the same grain bill to make multiple beers.)

The tax laws in a country largely influence the beers from that country. British beers are lower alcohol because of punitive tax laws that impose higher tax on high ABV beers.

## **#11. Beer Money.**

The majority of beer has always been produced for commercial profit in companies ranging from sole proprietor to international corporations. From 1393 AD until 1700's, the "Alewife" owned and operated the village taproom for profit. During the industrial revolution, mega-brewers consolidated smaller brewers and created corporations for profit. The profit motive means that bean counters scrutinize the bottom line and corporate greed influences the brewery product offerings.

The exception is beer produced by monasteries. These profits go to fund good works. At various points in history, Monasteries have produced, and sold, unique products, including beer and cheese. These beers are sought after, limited in quantity, and consistently high quality. In some cases the monks produce the beer, and in other cases they outsource the production under supervision.

## **#12. GMO.**

At some point, educated consumers always ask "Are GMO ingredients used in beer?" The answer is that GMO (Genetically Modified Organism) ingredients are not used in craft beers.

The reasons are:

1. GMO Barley isn't grown commercially.
2. Craft brewers and consumers take pride in their products and the craft brewing industry is aware that using GMO products will cause uproar with consumers.
3. Corn is a GMO crop grown in the United States, but corn is only used in small quantities in some specialty craft beers. Corn is less than 1% of craft beer ingredients.

Therefore, you can rest assured that you have many more health risks from the alcohol in beer than risking an allergic reaction to GMO corn.

## #13. Sunlight.

Sunlight makes gremlins immediately fester and melt into a grotesques green sludge. Although not as dramatic, sunlight is an enemy of beer.

Hops create iso-alpha acids during the boiling process. These iso-alpha acids provide stable bitterness to beer, which gives beer shelf-life of more than a few days.

But if beer is exposed to sunlight, the sun's power breaks down those iso-alpha acids. The resulting compounds bind with proteins that contain sulfur. This creates a new chemical — one that's almost exactly identical to the one released by skunks.

The best packaging that prevents beer from being exposed to sunlight is cans. Brown bottles are a good 2nd option, while clear glass is the worst way to package craft beer.

## **#14. Oxidation.**

Oxygen is another enemy of beer. Oxygen is bad for beer because it causes oxidation which makes beer taste old and stale.

Although not harmful to the consumer, oxidized beer is usually unappealing.

Oxygen gets into beer through leaky packaging equipment and leaky packages. For example, bottle caps allow a small amount of oxygen to creep into the beer which means that any bottled beer will oxidize given enough time. Beer cans are the best package to preserve and protect against oxygen ingress.

It is tricky to identify oxidation in a beer, because oxidation is manifested differently in beers, and some beer styles include a low level of oxidation as part of their character.

This is similar to a red wine where a small amount of oxygen adds interesting flavor as the wine ages. In general, oxidation is least welcome in pale beers, and more acceptable in dark, strong beers.

Here are two easy ways to identify oxidation in pale beers. Firstly, a pale beer turns faded amber color

when it oxidizes because oxidation darkens beer color.

Secondly, oxidized beer often tastes like licking a piece of cardboard. Therefore, if your light lager beer tastes like cardboard, it is likely oxidized.

In dark, strong beers such as Belgian Quadrupel (Quad) styles, oxidation can add desirable and interesting flavor notes. In these dark, strong beers, oxidation can taste like raisins..

Oxidation is almost universally unwelcome in beer. It is sometimes acceptable in small amounts in certain beer styles, but the best breweries do everything possible to keep oxygen out of finished beer.

## **#15. Temperature.**

You might have been served a glass of red wine on a 80 degree summer day and wondered why the wine tastes awful at this room temperature.

The reason is that many bartenders are not educated as to the proper serving temperatures of wine and beer.

As background, "Cellar temperature" is 55 degrees F, "Room temperature is 65 degrees F."

Wines should be stored at Cellar temperature. White wines are served at Cellar temperature and red wines at Room temperature.

As temperature increases, flavor molecules come out of suspension and drift up into the aroma of the wine or beer. White wine has fewer complex flavors, and is generally served with lighter meals, therefore, it naturally pairs well with serving at Cellar temperature.

In contrast, Red wines are served with more flavorful meals and the flavor molecules drift into the aroma from Room temperature.

However, over above 75 degrees, the alcohols dominate the flavor molecules and wine tastes too hot.

Beer has similar serving temperatures, although more complex because beer also includes the additional dimension of carbonation. As temperature increases, the carbonation escapes from the beer which leaves the beer feeling flat, warm and unappealing.

Generally, beers with light flavor should be served at 35 to 45 degrees, where consumers benefit from the refreshing taste of carbonation and cold on hot days.

As beers increase in flavor, the serving temperature increases. For example, IPA's are best between 45 to 50 degrees and more complex beers can be served at 55 degrees.



## #16. Glassware.

Glassware matters. Different beers are best served in different types of glasses to bring out specific characters in the beer.

There is no "best" glass for all types of beer, however, the worst type of glass for most beers is the "Shaker Pint" glass.

Here are some common characteristics of beer glassware.

1. It must be clean. Wash the glass to remove lipstick or any oils.
2. Rinse detergent off with clean water.
3. Air dry the glasses.
4. Tulip shaped glasses are usually good for beer, because they capture the aroma and concentrate the flavors for the consumer to enjoy.
5. Thin glassware is great so that consumers can warm up the beer by holding it in their hands.
6. Don't serve beer in chipped or scratched glasses.

## **#17. Cask Beer.**

During the 1800's, before stainless steel, mechanical refrigeration and forced carbonation, beer was transported and served in casks.

The benefit of naturally conditioned cask beer is that the beer tastes fresh, natural and flavorful. Cask beer is fresher than commercially produced and packaged beer. Just like home-made dinner tastes better than fast food, cask beer simply tastes better.

There are disadvantages to cask beer, which is why breweries only make cask beers for special occasions.

1. Once opened, the cask has a short shelf life of a few days. Any beer left in the cask after a few days is wasted.
2. Casks are temperamental and require careful, experienced handling to obtain the desired level of carbonation and hops at serving time.
3. Casks are heavy to move, and cumbersome. They are not conducive to modern transport methods like kegs are.
4. Cask beer is naturally conditioned, which leaves some sediment in the cask. This sediment is easily

disturbed when a cask is hoisted into place and it can make the beer hazy. Educated cask beer consumers expect this, whereas a novice beer drinkers are surprised by this haze.

5. Casks are stored at Cellar temperature, then put out at ambient temperature for serving. The beer warms up over time which entices more flavor from the beer while lowering carbonation level. Uneducated consumers will perceive this beer as "Flat and Warm" while educated cask beer consumers enjoy the changing character of the beer.

Casks are best used to serve certain beer styles, such as English Ales, where the beer is expected to have large amounts of flavor and slightly warmer beer. Cask beer is fresh, living beer and "You can't fake fresh".

## **#18. Reinheitsgebot.**

The "German Purity Law" of 1516 isn't what you would think it is. The popular perception is that the German Purity Law dictates the key ingredients for a beer for the purpose of protecting consumers from unscrupulous brewers using harmful products in their beer.

However, the Reinheitsgebot is actually a series of regulations limiting the ingredients to be used in beer, and controlling prices that innkeepers can charge. Consumer protection and beer purity is merely a side effect to the main purpose of the Reinheitsgebot.

This law was introduced primarily to prevent price competition with bakers for wheat and rye. The restriction of grains to barley was meant to ensure the availability of ingredients to bakers for affordable bread.

## #19. Sour Beers.

Different strokes for different folks is the term that comes to mind when discussing "Sour Beer". Just as you don't want sour beer in your fridge, but you want yogurt (which is essentially just sour milk), sour beer has it's place in the lineup for educated beer consumers.

The term "Sour beer" describes a large category of beers which are fermented out with non-traditional yeasts. A renowned sour beer brewery is Rodenbach, located in Roeselare, Belgium has been producing sour beers since 1836. Rodenbach is famous for creating beers in the Flanders Red Ale style and many modern breweries take their lead from Rodenbach.

Traditionally, sour beer was created by capturing wild yeasts and letting natural fermentation occur. This sounds romantic but the unpredictable nature of wild yeasts can keep brewers up at night. Fortunately, modern brewers can purchase blends from yeast laboratories and create repeatable sour beers.

Traditional beer yeast (*Saccharomyces*) leaves residual sweetness after it has completed fermentation. This residual sugar to balance the bitterness from hops in mainstream beers.

Wild yeasts can consume this residual sugar which then creates more acid (and lowers the pH) while also creating additional flavors that single-strain yeasts cannot create. Obviously, the lower pH means that the beer has a different character from traditional beer and brewers reduce the IBU level so that the hops don't make the beer too bitter.

Although not required, many sour beers are associated with oak barrels. This is because some bacteria and wild yeast impregnate wood and can never be removed from the oak barrels. Simply adding a clean beer to a sour barrel turns the beer sour without further intervention.

## #20. Saison.

"Saison" style beers are normally very light in color, and highly carbonated. If you can image a light Pilsner carbonated to the level of Champagne, then you are in the Saison ballpark.

The legend is that "Saison" beers were brewed by farmers in Belgium for migrant workers to consume during harvest season. Some sources infer that the word "Saison" loosely refers to "Season", meaning that it was brewed for a specific season of the year.

Supposedly, migrant workers were provided a ration of low alcohol, (around 3% to 4% ABV) refreshing beer as part of their wages to keep them hydrated during summer harvests. The Saison beer was supposedly produced using local ingredients on the farm, which means that the beer varied widely from batch to batch, depending on the ingredients in the brew shed.

Current research casts doubt on this legend. It is now believed that Saison beer was historically low ABV but over time morphed into higher ABV beer to meet market demands. Also, although it is a farmhouse ale, this is more of a regional brewery for a local community such as a few towns and not for a single farmer on his farm.

Saison yeast strains normally ferment rather warm, in the 90 degrees range and produce interesting

flavor profiles. The beers are usually very pale, hide the alcohol well, are easy to drink and have simple grain bills consisting of 100% continental Pilsner malt.

Unfortunately, the high fermentation temperature requirement for Saison yeasts limits New England brewers to the summer months of July and August each year. Coupled with the fact that Saison is a specialty beer for a niche market, means that most brewers would rather purchase a bottle from the store than make their own Saison.



## #21. Fruit and Beer.

Fruit is hard to incorporate well into beer because the fruit flavor changes during fermentation.

Some fruits, such as peaches ferment out completely and no peach flavor comes through in the fermented beer. All you get is an expensive, soggy mess of spent peach pulp. Other fruits, like strawberries, impart only a small amount of color.

Given the artistry required when working with fruit, most brewers resort to artificial flavoring or substitutes to give the perception of fruit in a beer. This is a delicate balance because educated consumers can detect artificial flavoring at very low thresholds.

When you find a well-crafted fruit beer, rest assured that the brewer conducted multiple experiments to obtain the best balance of fruit and beer. (Oh, and probably spent a good amount of time with some buddies to peel many pounds of blood oranges.)