Volume 68 *January 2021*

The Greater Everett Brewer's League Journal

The purpose of The Greater Everett Brewers League is to promote and educate homebrewers in the production of craft-style homebrewed beers. The greatest homebrew club in the world in our opinion only. As an AHA social club we improve members brewing skills by providing mentoring and networking to fellow brewers, promote BJCP judging, evaluation and competition entry, as well as promoting the local craft beer movement.

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Join Zoom Meeting
https://us02web.zoom.us/j/83114787199?pwd=SDkxUHVOb3VXbW9DMzVrUHA5RGJiZz09

Meeting ID: 831 1478 7199
Passcode: 093700

Brewing in the New Year

I hope this news letter finds you all healthy and doing well. As we look forward to a new year and with luck things will start to get back to normal.

We are looking forward to next month's Same Brew Coffee Porter and we have a lot lined up. Hope to see a lot of you online.

It's been a busy month and I hope everyone is finding time to brew. If you are trying something new or just want to share something please let us know.

Brewing with Coffee (W Fredin)

There are multiple methods of brewing with coffee and a few are summarized below. I do provide some rough estimates but these will vary depending on your personal preference, type of coffee, …. They are only personally unveted guidelines.

Questions to answer. Hot or Cold Brew? In the kettle, mash, post boil steep, fermentor, at kegging. Finally, the whole bean or ground?

Adding coffee In the brew:

Brewers often use coffee on brew day. Placing it either in the mash or in the kettle the rich dark flavor will make its way into the final product. This is an easy way to get coffee into the brew. However, coffee flavor can become over acidic and possibly asstinget with high temperature extraction. Also it is difficult to regulate the strength or intensity of the flavor. I might suggest ¼ lb of coffee in the mash or steep for 5 min at the end of boil.

Adding coffee in secondary

From a talk at NHC I first learned of whole bean to say. Basically brewers steep whole beans in fermenter or keg. Usually it takes from 48-72 time. The steeping process allows the brewer to throughout the process and remove the beans strength is meet. Personally, I am planning on oz of whole beans.

dry coffeeing so your secondary hours of steeping taste the beer when a desired starting with 4-8

Adding cold brew or espresso shots.

Another easy way to regulate the strength and flavor is to add highly concentrated coffee to the final brew. To do so you can add espresso or high concentrate cold brew. A recipe for cold brew is linked below. Like with steeping beans you can add concentrate until you reach a desired flavor. I would start with the rough estimate of 16 oz per 5 gallons. However, starting lower and adding more is the best strategy.

Final thoughts:

However you plan to put coffee in your beer please take some good notes on quantity, variety of coffee and process. This way we can pass it on to others during the tasting.

More info on Adding Coffee to beers

Craft Beer and Brewing Great Videos at the end

Brulosophy experiment with hot and cold additions

How to make Cold Brew

BYO Article

Mr Beer Article

Brewing Water

Water adjustment can make the difference between a good beer and a great beer if it is done right.

JOHN PALMER Jan 29, 2016 - 14 min read

What properties and characteristics does a brewer want from water? What kind of water should be used to make stouts? IPAs? These are the kinds of questions I am frequently asked. Fortunately, the answers aren't hard.

Brewing water affects the beer in three ways: It affects the pH of the beer, which affects how the beer flavors are expressed to your palate; it provides "seasoning" from the sulfate-to-chloride ratio; and it can cause off-flavors from chlorine or contaminants.

In general, brewing water should be clean and free of any odors, such as chlorine or pond smells. Usually, good brewing water for conducting the mash and creating the wort should be moderately hard and have low-to-moderate alkalinity. But it depends (doesn't it always?) on the type of beer you want to brew and the mineral character of your water.

Basically water comes from two sources: surface water from lakes, rivers, and streams; and groundwater, which comes from aquifers underground. Surface water tends to be low in dissolved minerals but higher in organic matter, such as leaves and algae, which need to be filtered and disinfected with chlorine treatment. Groundwater is generally low in organic matter but higher in dissolved minerals.

Good beer can be brewed with almost any water. However, water adjustment can make the difference between a good beer and a great beer *if it is done right.* But you have to understand that brewing is cooking and that seasoning alone will not make up for poor ingredients or a poor recipe.

The common conception is that the best beer is made from mountain springwater, and this is generally true, although probably not for the reasons you think. Mountain springwater (i.e., a clean surface water source) is good for brewing because it is largely mineral free, which lets the brewers add any mineral salts they feel are necessary for the beer. And that leads us to a quick refresher in chemistry.

Ions

Recall that an ion is an atom or a group of atoms that has a net positive or negative charge due to the loss or gain of an electron. The ions in brewing water are the cation (positive) and the anion (negative) components of the minerals dissolved in the water. The principal cations we're interested in are calcium (Ca^{+2}), magnesium (Mg^{+2}), and sodium (Na^{+1}). The principal anions are bicarbonate (HCO_3^{-1}), sulfate (SO_4^{-2}), and chloride (Cl^{-1}).
The calcium cation is the principal ion that determines hardness. It promotes clarity, flavor, and stability in the finished beer. The magnesium cation also contributes to hardness and affects the mash pH, but to a lesser extent than the calcium. The sodium cation doesn't contribute to water hardness. In small amounts (<100 ppm) it is benign, but at larger concentrations, it can cause the beer to taste minerally or metallic.

The carbonate family of ions is the big player in determining brewing water chemistry. Carbonate (CO_3^{-2}) and bicarbonate determine the total alkalinity of the water and raise the pH of the mash and beer. The sulfate anion accentuates hop bitterness, making it seem drier and crisper. It's weakly alkaline but doesn't contribute to the total alkalinity.

The chloride anion acts to make the beer seem fuller and sweeter. It has the opposite effect of sulfate. In fact, the sulfate-to-chloride ratio is a good way to gauge the effect of the brewing water on the balance of the beer. For example, a sulfate-to-chloride ratio of 2:1 or higher will tend to give the beer a drier, more assertive hop balance, while a beer with a ratio of 1:2 will tend to have a less bitter, rounder, and maltier balance. However, this effect is just like salting and seasoning your food; it helps accentuate the flavors that are there but will not fix a bad recipe. Finally, you should understand that chloride is not the same as chlorine, which is used as a disinfectant. The concentrations of each are unrelated to the other.

Hardness and Alkalinity

Water hardness is defined as the amount of dissolved calcium and magnesium in the water. Hard water has a lot of calcium and magnesium; soft water doesn't. Water softeners work by chemically replacing the calcium and magnesium in the water with sodium or potassium.

And here is the problem for brewers: recall that I said earlier that good brewing water should be moderately hard. It should have a minimum level of total hardness of about 150 ppm as calcium carbonate (CaCO3). Water softeners remove the hardness but leave the alkalinity behind.

Hardness and alkalinity are opposites. While hardness is calcium and magnesium concentration, alkalinity is carbonate and bicarbonate concentration. Alkaline water is high in bicarbonates. The alkalinity in water acts to raise the pH of the water and the beer, and this can be a problem for the beer flavor, especially for the paler styles.

However, the pH of the water isn't what really matters. What really matters is the chemistry of the mash and wort. The grain bill can significantly affect the pH of the mash. For example, using dark roasted malts in the mash can neutralize alkaline water to achieve a proper mash pH.
So while knowing the water pH is slightly useful, the mineral composition of the water—and its effect on the wort and beer pH—is most important. Higher beer pH makes the beer taste dull. (Try adding half a spoonful of baking soda to a glass of tomato juice to taste the effect.) Low beer pH attenuates the beer flavors, and the beer will lose complexity.

How much alkalinity is high? Generally, high alkalinity is anything greater than 100 ppm as calcium carbonate. However, alkalinity greater than 50 ppm can be considered high for extract brewing because you are rehydrating a dehydrated wort that already has minerals and alkalinity in it. The alkalinity in your water will add to what's already there.

Here is the bottom line: If your water is softened or highly alkaline, you should not use it for either extract or all-grain brewing. The alkalinity of water can be reduced by aeration and pre-boiling or by diluting it with distilled or reverse-osmosis water.

A Word to the Wise

Historically, many famous beer styles were developed in conjunction with the water from the region, but you need to understand that brewers have been adjusting their water for hundreds of years. For instance, the water of Pilsen (where Pilsner originated) is very soft, free of minerals, and very low in bicarbonates. Brewers in this region typically added salts to raise the hardness in the water. On the other hand, brewers in Burton-upon-Trent (famous for its IPAs) frequently pre-boiled their water to reduce the hardness.

So don't assume that you have to use the exact water profile that you find on the Internet for Dublin, Ireland, if you want to brew a good stout. The water profile for a famous brewing city may be a step in the right direction, but do your research and find out how the brewers of that region/style actually used the water to brew their beer.

Water Report

How do you know your water's alkalinity and hardness? Often that information is contained in your city water report. Water reports are primarily concerned with testing for contaminants, so you will usually find Total Alkalinity and Total Hardness numbers in the Secondary Standards or Aesthetic Standards section. As a brewer, you generally want to see Total Alkalinity less than 100 ppm and preferably less than 50 ppm, but that is not very likely. You will typically see Total Alkalinity numbers between 50 and 150.

For Total Hardness, you generally want to see a value of 150 ppm or greater as calcium carbonate. Preferably, you would like to see a value greater than 300, but that is not likely either. Typically, you will see total hardness numbers in the range of 75 to 150 ppm because water companies don't want carbonate scale in their pipes. In fact, almost every city's tap water, everywhere in the world, is generally going to be higher in alkalinity and lower in hardness than we would prefer for brewing.

You can also test your brewing water for total alkalinity and total hardness by using a water test kit, such as the Lamotte BrewLab. These are simple drop-test kits similar to what you would use for a swimming pool.

What You Can Do

Once you have your water's information, you can use the calculations in my book, *How To Brew,* and/or use brewing software to calculate how much of what to add. A common practice is to start with a low hardness, low alkalinity water source and add brewing salts to the mash and/or kettle. For hoppier beer styles such as American Pale Ale or American IPA, you can add calcium sulfate (gypsum) to the water to make the beer taste drier and have a crisper, more assertive bitterness. For maltier styles, such as Oktoberfest or Brown Ale, you can add calcium chloride to the water to make the beer taste fuller and sweeter.

Generally, you don't want to exceed 400 ppm for sulfate or 150 ppm for chloride. Sulfate and chloride are the seasoning for your beer, and their ratio will affect the flavor balance to a large degree. A hoppy beer will generally have a sulfate-to-chloride ratio of 3:1 or higher, and you don't want both of them to be at their maximum because that will just make the beer taste like mineral water.

Tips For All-Grain Brewers

I have only scratched the surface of what there is to know about water chemistry and mash pH. Read chapter 15 in *How To Brew* (John Palmer, Brewers Publications, 2006) or chapter 5 in the *Water* book (John Palmer and Colin Kaminski, Brewers Publications, 2013) to learn more about both.

>> Don't add salts to your water without an understanding of how they will affect your mash pH.
>> Measure the pH of your mash after you've added water to the grain.

It is that pH that affects the activity of the mash enzymes and the propensity for the extraction of astringent tannins from the grain husks. Start the mash, check the pH, and then make adjustments.

>> The mash pH should be in the range of 5.2–5.6, 10–15 minutes after dough-in, after the sample has been cooled to room temperature.

Pour a wort sample (about 2 tablespoons or 30 milliliters) onto a large plate to help it cool quickly.

Tips For Extract Brewers

Malt extract is concentrated wort, and the extract's brewmaster has already made the water decisions. All you really need to be concerned about as an extract brewer is rehydrating the malt extract back to its original composition. And for that, a low mineral mountain stream source or distilled water source is ideal.

If you want to add brewing salts to your water, I urge you to brew the beer without the salts first and see how it tastes. This is where water adjustment gets tricky for extract brewers: You don't know how much sulfate or chloride is already present in your malt extract. It doesn't matter whether you are brewing with dry malt extract or liquid malt extract; the minerals are still there.

If you want to add brewing salts to enhance the flavor of the beer, use either 1 gram of calcium sulfate per gallon (3.8 liters) of wort for bitterness or 1 gram of calcium chloride per gallon (3.8 liters) of wort for fullness. Don't use both, and don't exceed 1 gram per gallon (3.8 liters) until you have brewed with that extract recipe and determined how it tastes.

Remember, don't go overboard with water adjustment. Brewing is cooking, and using brewing salts and acid additions can easily be overdone, just like over-salting your food.

Using a Hydrometer for Beer Brewing

by BRAD SMITH *on* MARCH 18, 2011 ·

A hydrometer is one of the simplest tools a home brewers has at their disposal, but also an important one so I thought I would spend a few moments this week discussing how to properly use a hydrometer and also how to adjust your hydrometer readings for temperature. Most brewers rely on a hydrometer to determine their original and final gravity, and more advanced users will also track mash gravity and end of fermentation gravity.

What is a Hydrometer

A hydrometer is a very simple device that looks like a large thermometer. When you immerse it in wort or finished beer it sinks to a varying degree depending on how dense the wort is and provides a reading of the specific gravity. Most hydrometers used by home brewers are scaled for specific gravity readings, which is technically a unitless measure that generally ranges from 1.000 for water to 1.100 or higher for high gravity barley wines. An average beer might have a starting gravity between 1.040 and 1.050 and a final gravity around 1.010.

The reason specific gravity is unitless is that is is simply a measure of the density of the liquid relative to water – so 1.000 would be the density of distilled water, and most wort or beer has a gravity slightly above that of water (1-10% higher actually). To calculate the specific gravity of a liquid sample with known density, we just divide its density by the density of water – that is the specific gravity value.

Many professional brewers use hydrometers that measure in degrees Plato, which is another density system developed by Bohemian scientist Karl Balling in 1843 and later improved by Fritz Plato. This scale is a measure of density relative relative to the percent sucrose in the water, so a reading of 11 degrees plato would be equivalent in density to water with 11% sucrose dissolved in it.

Converting from plato to specific gravity is not strictly linear, but most brewers use the approximation of 1 degree plato = 4 points specific gravity, so 12 degrees plato would correspond to 48 points of specific gravity, or a measure of 1.048 approximately. For significantly larger values the approximation starts to drift off, so its best to use a calculator at that point (such as the one in BeerSmith).

Actually Using a Hydrometer

Use of a hydrometer is a pretty simple affair. You typically remove a small amount of

sample wort, place it in a clear sample cylinder and then immerse the hydrometer in the liquid. Read the gravity reading from the scale on the hydrometer where it crosses the water-air boundary. There will be a slight curve along the water-air line (called the meniscus), so if you want to be really accurate you should take the reading at the lowest point in that air-water curve (the bottom of the meniscus).

One final cautionary note – many beginners tend to take the sample in the tube that the hydrometer was sold in. You need to be a bit cautious when doing so as the tube is quite small and the hydrometer will sometimes stick to the side a bit which could give you an inaccurate reading. Ideally you want it floating freely in the wort, which is why more advanced brewers will purchase a small sample vessel or use another vessel to hold the sample.

Adjusting for Temperature

Hydrometers are all calibrated to be accurate at a standard temperature. For most home brewing hydrometers, the calibration temperature is 60F (20C), though a few laboratory hydrometers are calibrated to a different temperature (usually 68F/20C). The calibration temperature is usually printed on the scale of your hydrometer in really small letters.

Manufacturers calibrate the hydrometer to be accurate at their calibration temperature, and its often a good idea to validate that by cooling a sample of distilled water to that calibration temperature and verifying that your hydrometer reads 1.000.

If you use your hydrometer at another temperature other than the calibration temperature you should add or subtract a small adjustment to get an accurate reading. In practice, if you are working near room temperature the adjustment is relatively small (typically one point). However when you measure hot wort (such as wort coming from the mash tun or boiler) the difference can be significant and you should adjust your hydrometer for the calibration temperature.

The formula I use in BeerSmith is:

sg = sg_measured + sg_measured * (1.628E-5 * (tc – t) – 5.85E-6 * (tc*tc – t*t) + 1.532E-8 (tc*tc*tc – t*t*t))

where sg_measured is the measured value, tc is the calibration temperature and t is the temperature (both in celsuis the sample was measured at. This gives a pretty accurate measure, but its not much fun to calculate by hand, so there is a hydrometer calculation tool in BeerSmith to do this adjustment for you.

Thanks for visiting the BeerSmith Home Brewing Blog.

INCREDIBLE GEBL RECIPES

If you have a great recipe to share or just something you like please send to editor@gebl.org so it can be included

Brow Brau Porter Brew Session

Ingredients and Process

Ok – most of this information is coming right out of BYO magazine, so pick up the issue if you want the full story. I did have to modify the yeast strain because Jasper's Home Brew Supply didn't have what the recipe called for. Well, they had SafAle S-04 but I didn't want to use that yeast.

Grains

8 pounds (3.6 kg) Crisp Maris Otter pale malt
2 pounds (0.91 kg) Crisp brown malt
0.3 pounds (0.14 kg) Crisp black malt

Hops

1.5 ounces (42 grams) of East Kent Goldings Hops (~5.1% AA) added with 60 minutes to go in the boil

Yeast

Wyeast 1028 London Ale

Process

The article has rice hulls listed as an optional addition. I didn't add any. I had no fears of a stuck sparge. I mashed for 60 minutes, and the temperature stayed between 155°F – 150°F (68°-66°C). Collected about 2 gallons of wort from the first runnings, so I collected 4.5 gallons from the second runnings.

Once all the wort was collected, I boiled it for 60 minutes and then chilled it down to 65°F (18°C). Once it was chilled, I racked it to my clean, sanitized fermentor and pitch the swelled packet of yeast.

The starting gravity was 1.049. We'll see what the final gravity ends up being and how this beer tastes in the future post/video.
BREW ON!
-Brew Dudes Blog https://www.brew-dudes.com/

Greater Everett Brewers League

CLUB SCHEDULE

January 14, 2021: Nunchucks Beer tasting IPA and Stout

February 11, 2021: Same Brew Porter (should have picked up recipe by now)

March 11, 2021:

May 1, 2021: Big Brew Day, Probably virtual. Brew together Virtually

EVENTS

IPA challenge. TBA

Membership Drive: We are always looking for new members. Please let us know if you have anyone interested. As suggested by one of our members, wearing your GEBL gear helps start a conversation. If you have any ideas please let us know.

If you would like to be added to the GEBL email list send your request to: ed_andresen@hotmail.com**:**
The GEBL Elected Club Officers for 2121 are:

- President: Jesse Free (president@gebl.org)
- Vice President: Todd Johnson (vicepresident@gebl.org)
- Treasurer: Pete Stachowiak (treasurer@gebl.org)
- Secretary: Will Fredin (secretary@gebl.org)
- Librarian: Robin Sparks (library@gebl.org)
- Newsletter: Bryan Collazo (editor@gebl.org)
- Membership Coordinator: Randy Neumaier (membership@gebl.org)

Our website is at http://www.gebl.org/
Our correspondence address is: GEBL PO Box 13392 Everett, WA 98206