HAWKES BAY AMATEUR WINEMAKERS

AND BREWERS CLUB

October 2022

WEBSITE: **www.wine-and-beer-hb.org.nz**

Hi everyone,

We hope to see you all at the next Club Meeting on Wed 19th October, at the Deaf Clubrooms 22 Lee Road Taradale at 7.30pm.

We will have a rundown and discussion on how things went at the Regional Competition held last weekend as well as the usual Fat Monk and Points Cup judging.

At last months meeting Catherine Carter, the Hawkes Bay Rep for Lion Breweries, presented some of their Panhead, Macs and Emersons Craft Beer range. Some interesting beers were sampled and we got to hear the stories behind them.
As a result of her generosity, there are bound to be some of these beers in the raffle prizes for quite a while, as well as some good Chardonnay.

The raffle last month was won by David.

Regional Comp Entries;

Not to spoil the good news for Wednesday, but we all did very well at the Regionals last weekend, and a great time was had by all.

Clubnight Raffle;

Still only $2 a raffle or three for $5. And so full of fermented goodness.

Club Member List;

Maurice has updated and circulated our list of current members, if you didn't receive a copy by email last month, then you must not be on it. This can be easily fixed by joining the club. It is only $10 for the remainder of the year. Simply pay the $10 sub into the Club account online to ASB 12-3145-0229205-00 using your name as a reference for the deposit. ….. and of course, come along to the next clubnight.

Bit of Trivia;

Cenosillicaphobia (pronounced sen-no-sill-ick-uh-fobia) is the fear of an empty glass. This phobia can pertain to glasses lacking in beer, wine, or a cocktail.

Did you involuntarily shudder at this sight? If so, I hate to be the bearer of bad news, but you may have Cenosillicaphobia. Don't worry though, you are not the only one, and all your fellow Club members, are here to support you!

<u>Upcoming events;</u>

- 19th October is club night, we meet at the Deaf Clubrooms 22 Lee Road Taradale at 7.30pm. We will have a rundown and discussion on how things went at the Regionals.

  The classes for our points cup judging are:

W3	Sweet Red Grape.
W24	Port.
W28	Draught Cider.
B10	Dark Ale

- For November we are planning a Lunch outing to De la Terre at Sherenden on the Taihape Road.

- Other possibilities being investigated for November are Zeffer Cidery and Tom McDonald wines in TeAwanga.

- December Christmas Dinner outing has been slated for Thai Chef in Napier.

This Month, we have some excerpts from Marc Sedams “Guide to Water Treatment”.

A Guide to Water Treatment

By Marc Sedam (Brewing Techniques)

Water: It is by far the major component in beer. So why is it the one ingredient most often ignored by brewers?

Most home and craft brewers use the water most readily available to them, untreated, to brew all styles of beer. They may add gypsum to an IPA or stout recipe, but do little else to alter the profile of their brewing water. This approach can result in good individual beers, but is not the best way to produce consistently great beers brewed to style. It is no coincidence that brewers in Munich make dark, malty lagers; that those in Burton-on-Trent brew hoppy pale ales; or that early immigrants settling in the American Midwest (where the water was soft like that of Bohemia) brewed Pilsener-like lagers. The quality and composition of the local water in each case uniquely accentuates the flavors in these indigenous styles. You will no doubt find that if untreated water is used at your local brewpub or brewery, the same trend applies: The best beers are those most suited to the local water supply.

Fortunately, brewers can brew beyond the limitations of their local water supply to create excellent beers of any style. In most cases it takes only a few simple changes to the mineral content of your available water supply to create a medium that will bring out the flavors you’re aiming for. Water treatment: It’s not just for the big brewers anymore.

Begin at the Source

All rational plans for water treatment require knowledge of the specific composition of your local water. This information can be obtained by calling your local water utility and asking for a copy of their most recent water quality report. (Home brewers may be able to get an up-to-date report from a friendly local microbrewery or brewpub.) My water in Durham, North Carolina, comes from a protected upstate watershed. It is wonderfully soft and has remained very stable through the changing seasons and during the past several years. When I requested a water quality report, not only did I receive an overall analysis of my water, but also the actual measurements for each month of the year, including pH and water temperature!

Tables I and III list many minerals of major and minor importance in brewing. A typical water quality report should list all of these minerals and many other trace elements as well. You can compare your water quality report with the mineral profiles of particular styles of beer and embark on a simple water treatment program to replicate the desired mineral profile of almost any style.

The Underlying Principles: pH, Hardness, and Alkalinity

Any discussion of water treatment must be prefaced with an understanding of the principles of pH, hardness, and alkalinity. pH is a measure of relative acidity or basicity; hardness is a measure of the total calcium and magnesium ions in solution; and alkalinity, in this context, is a measure of the water’s buffering capacity. All three are interconnected, interrelated, and intimately tied to the mineral profile. They should all be considered in conjunction with any treatment program because they will have a significant effect on how the treatment is to be performed.

pH: pH is a topic that could fill many, many books, and my oversimplification will no doubt do it a certain injustice. Those interested in more details on pH and measurement can refer to A.J. deLange’s two-part series in BT.

Working with pH. Different steps in the brewing process require different pH ranges. Brewing water, for example, is best kept at a pH range of 6–7. The mash should be kept within pH 5.2–5.5 (at mash temperature) for optimal enzymatic action (alpha- and beta-amylase are proteins and will denature if the pH veers much outside this range). In wort, proper pH is important for coagulation of proteins; during fermentation, the optimal pH will promote a good environment for yeast, but an unwelcome environment for bacteria. The finished beer pH should fall between 4 and 5.

What is pH? The pH of a liquid is determined by the combination of dissociated salts, undissociated salts, and organic compounds it contains. Pure, distilled water is a mixture of hydrogen, or hydronium (H+) and hydroxide (OH–) ions, each having an identical concentration of 10–7 mol/L.* The relative concentration of these two ions determines the water's pH; thus, when the concentration of the ions are in equilibrium, the water has a neutral pH. When a strongly acidic or basic substance is introduced, it upsets the equilibrium and changes the characteristics of the water. Specifically, water with an excess of hydrogen ions is acidic, and water with an excess of hydroxide ions is basic. Table II, "Distribution of Carbonates Versus pH," shows how the composition of the three forms of bicarbonate change with respect to pH.

*A mole, or mol, is 6.02 X 1023 atoms or a particular element — one mole of an element is equal to its gram molecular weight.

In mathematical terms, pH is the negative logarithm of the hydrogen ion concentration in solution (–log [H+]), most commonly expressed as a number between 1 and 14. Though it may seem backwards, the pH scale exists such that the greater the concentration of hydrogen ions present in solution (the more acidic it is), the lower the pH. pH values between 1 and 6.99 are acidic and values between 7.01 and 14 are basic; a pH of 7 is neutral. Because of the log scale, the difference between two pH values is not one, but ten. Therefore, a pH 5 solution has 10 times the hydrogen ion concentration as a pH 6 solution and a pH 5.7 solution has 3.1 times the hydrogen ions as a pH 5.2 solution.

How to measure pH. pH can be measured by an electronic pH meter or by lower-tech pH strips. A typical meter will measure pH in increments of 0.01 and display the reading in an easy-to-read liquid crystal display. pH strips are much more widely available and are in the frugal brewer's price range. The most commonly found strips are accurate for increments of 0.2 pH units and represent pH as a color on a calibrated color scale. pH strip readings are highly subjective when used with worts greater than 15 °L (the slight color changes can also be difficult for some people to distinguish, and impossible for people who are color-blind). When dealing with dark beers, it might be advisable to fine-tune pH in either the brewing water or in the mash with a more highly accurate pH meter. Because pH is a logarithmic scale, each increment weighs heavily, and the more accurate the measurement, the better your batch-to-batch repeatability. More accurate and easier to read pH strips are available, but for those who really want to be sure, a pH meter can be a wise investment.

Hardness: The term "hardness" describes water with which it is hard to generate a lather from sodium-based soap. Hard water makes lathering difficult; soft water (or the lack of hardness) makes lathering easy. Hardness is defined technically as the total concentration of calcium and magnesium dissolved in solution. Alkali metals that are less electronegative, such as sodium and potassium, are much more stable in water (meaning they will not precipitate), have little effect on mash pH, and thus do not significantly figure into the calculation of total hardness (see Table I).

How to measure hardness. Hardness is (perhaps confusingly) listed in a water analysis report as "ppm hardness as CaCO3." Though it may not be apparent, this reading also takes into consideration the other minerals that make up hardness; the "as CaCO3" convention simply allows for an easy comparison of hardness (represented by the calcium cation "Ca") to alkalinity (represented by the carbonate anion "CO3"). Hardness is quantitatively measured by titration to end point with a chelating agent such as EDTA that binds magnesium and calcium ions.

Table I: Major Minerals		*Data from reference 1–6.*	
Compound	Effect on Beer Taste	Effect on Mashing/Wort Composition	Effect on Fermentation
CATIONS: POSITIVELY CHARGED IONS			
Calcium (Ca^{+2}) [Range: 5–200 ppm] <u>AVAILABLE FORMS</u> 1.$CaCl_2 \bullet 2H_2O$ (calcium chloride) 2. $CaSO_4 \bullet 2H_2O$ (calcium sulfate/gypsum) 3. $CaCO_3$ (calcium carbonate/chalk) 4. $Ca(OH)_2$ (hydrated lime)	· Extracts fine bittering compounds from hops (1) · Absence will cause oxalate salts to precipitate, resulting in haze and gushing (6)	· Decrease mash pH · Precipitation with K_2HPO_4 improves hot break · Helps precipitate carbonates · Gelatinizes starch granules · Stabilizes alpha-amylase · Decreases extraction of tannins · Reduces wort color · Forms insoluble salts with carbonate and phosphate	· May overprecipitate organic phosphates, depriving yeast of essential nutrients · Small amounts help neutralize peptone & lecithin (yeast toxins)
Magnesium (Mg^{+2}) [range: 2–30 ppm] <u>AVAILABLE FORMS</u> 1. $MgSO_4 \bullet 7H_2O$ (epsom salt)	· Accentuates beer flavor · Imparts harsh bitterness when in excess · Levels over 125 ppm act as a diuretic and laxative	· Essential cofactor for some enzymes · Decreases mash pH, but to a lesser extent than calcium	· Yeast nutrient
Sodium (Na^{+}) [range: 2–150 ppm] <u>AVAILABLE FORMS</u>	· Levels greater than 75 ppm add a disagreeable harshness · Sour, salty taste may	· Does not participate in mash	· Excessive levels can be poisonous to yeast

ANIONS: NEGATIVELY CHARGED IONS			
Carbonate (CO_3^{-2}) Bicarbonate (HCO_3^{-}) [range: 30–500 ppm] <u>AVAILABLE FORMS</u> 1. chalk 2. baking soda	· Promote rounded malt flavor · High levels create harsh, bitter flavors in lagers	· Strong buffer against any change in pH · Existence is pH-dependent (see Table II) · Precipitates out with calcium · Hinders starch gelatinization · Impedes trub flocculation during cold break · Extracts excessive tannins	· Increases risk of contamination of the fermentation by maintaining elevated pH levels if not adjusted (6)
Sulfate (SO_4^{-2}) [range: 20–150 ppm] <u>AVAILABLE FORMS</u> 1. epsom salt 2. gypsum 3. calcium sulfate, anhydrous	· Gives beer dry, full flavor · Above 500 ppm, taste is sharply bitter · A laxative in conjunction with magnesium and sodium	· Weakly basic · Alkalinity is overcome by most acids	· Source of sulfur if the yeast or bacteria present are prone to create hydrogen sulfide (H_2S)
Chloride (Cl^-) [200–300 ppm] <u>AVAILABLE FORMS</u> 1. table salt 2. calcium chloride	· Accentuates bitterness · Enhances beer flavor and palate fullness (sensation reduced as a calcium or magnesium salt) · High concentration leads to "salty" flavors	· Increases stability · Improves clarity	· Excessive levels can be toxic to yeast

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More next month …..

CHEERS !
And see you all on Wednesday.
Jim