



BREWING YOUR OWN BEER:

YOUR PERSONAL BREWERY



Tom Wilbur, Barleycorn's Craft Brews
21 Summer Street, Natick, MA
www.barleycorn.com

Today's Topics

- What's in my beer?
- Types of beer
- How is beer made
- Why homebrew
- Your brew session
- Key things to remember
- Resources



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What's in my beer?

Grain

Water (92% water)

Hops

Yeast



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What's in my beer? - grain

Grain

Source of fermentable sugar, flavor and color

Malted barley, wheat, oats, corn

Base versus specialty malts

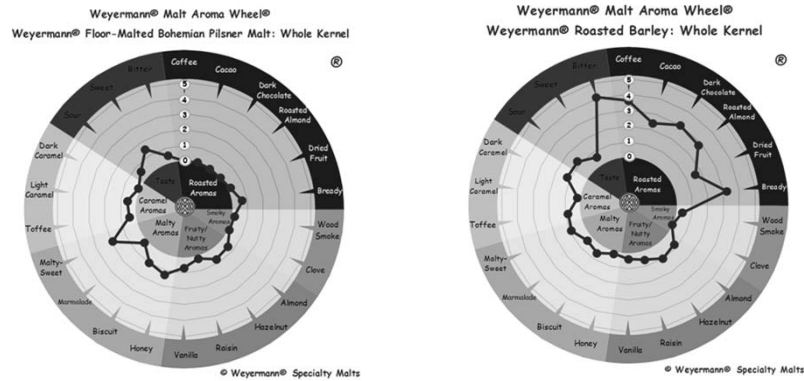
Crystal malts are cooked to start the enzymatic conversion of starches into fermentable sugars, and some of the sugars are caramelized malt reaches its final color.



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What's in my beer? - grain



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What's in my beer - water

Water

Beer styles led to regional beer styles-

- > Munich's soft water is great for brewing of Hefe-Weizen, Oktoberfest, Pils, and Lagers

Get a town water report

Online software can aid in water analysis www.brewersfriend.com

Consider removing chlorine with a charcoal filter



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What's in my beer? - water

Load from profile: Natick Water

Water report: Full

Calcium: mg/l

Magnesium: mg/l

Sodium: mg/l

Chloride: mg/l

Sulfate: mg/l

Alkalinity As: Bicarbonate Alkalinity

Alkalinity: ppm as CaCO₃

pH:

Target Water: Pilsen (Light Lager)

Description: This very low mineral water is the traditional water for Bohemian pilsner beers. Despite its low calcium content, great pilsner and Helles style beers can be brewed with it.

Ca+2	Mg+2	Na+	Cl-	SO ₄ -2	HCO	mg/l
<input type="text" value="7"/>	<input type="text" value="3"/>	<input type="text" value="2"/>	<input type="text" value="5"/>	<input type="text" value="5"/>	<input type="text" value="25"/>	

Mash pH *: 5.21

Mash thickness: 1.60 qt/lb
pH Delta from Water: -0.38
effective water residual alkalinity: 86.21 ppm as CaCO₃
effective strength of weak acids: 272.77 ppm as CaCO₃
*mash prediction is for mash sample cooled to 25 C / 77 F

Overall Water Report:

Ca+2	Mg+2	Na+	Cl-	SO ₄ -2	Alkalinity	Residual Alkalinity
mg/l	mg/l	mg/l	mg/l	mg/l	ppm as CaCO ₃	ppm as CaCO ₃
37.0	8.0	79.0	171.0	16.0	110.5	79.4
▼ low	★ normal	★ normal	★ normal	▼ low	Range Check	

SO₄²⁻/Cl⁻ ratio: 0.1 Too Malty
Total lactic acid as equivalent acidulated malt in grist: 5.7 %



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What's in my beer? - hops

Bittering hops are high in alpha acids that are isomerized during the boil to create iso-alpha acids (they also have a high % of cohumulone)

Aroma hops are high in essential oils that become volatile and evaporate after boiling 20 minutes

The timing and quantity of hop additions is critical to the taste of your beer




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What's in my beer? - hops



A BITTERING HOP

WARRIOR®

BRAND YCR 5
UNITED STATES

★ ★ ★ ★ ★

AROMA PROFILE: PINE, HERBAL

Developed by Select Botanicals Group, Warrior® Brand YCR 5 was selected for its high alpha content, low co-humulone, good storage stability and tolerance to powdery mildew. It is primarily used in brewing for its mild, clean bittering properties and has good pickability of a medium size cone in the field.
To view a sample recipe using Warrior® brand hops, [click here](#).
Aroma: Specific aroma descriptors are mild, resinous and subtle pine.

BREWING VALUES

ACID/OIL	RANGE	LOW	HIGH
ALPHA ACID	15.5-18%	0	20
BETA ACID	4.4-6%	0	15
TOTAL OIL	1-2.5 mL/100g	0	4


Alpha Acid	15.5 - 18%
Beta Acid	4.4 - 6%
Co-humulone	25 - 28%
Total Oil	1 - 2.5 mL/100g
B-Pinene	0.5 - 0.7% of total oil
Mycene	40 - 50% of total oil
Linalool	0.4 - 0.7% of total oil
Caryophyllene	11 - 14% of total oil
Farnesene	< 1.0% of total oil
Humulene	15 - 18% of total oil



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What's in my beer? – aroma hops



AN AROMA HOP

CITRA®

BRAND HBC 394
UNITED STATES

★ ★ ★ ★ ★

AROMA PROFILE: CITRUS, TROPICAL FRUIT

Developed by Hop Breeding Company and released in 2007, Citra® Brand HBC 394 features fairly high alpha acids and total oil contents with a low percentage of co-humulone. It is tolerant to downy mildew and powdery mildew with good pickability of dense, medium sized cones. Comprised of Hallertau Mittelfröh, US Tetra, Brewer's Gold and East Kent Golding.
Aroma: Specific aroma descriptors include grapefruit, melon, lime, gooseberry, passion fruit and lychee.

BREWING VALUES

ACID/OIL	RANGE	LOW	HIGH
ALPHA ACID	11-15%	0	20
BETA ACID	3-4.5%	0	15
TOTAL OIL	1.5-3 mL/100g	0	4

Alpha Acid	11 - 15%
Beta Acid	3 - 4.5%
Co-humulone	20 - 24%
Total Oil	1.5 - 3 mL/100g
B-Pinene	0.7 - 1% of total oil
Mycene	60 - 70% of total oil
Linalool	0.6 - 0.9% of total oil
Caryophyllene	5 - 8% of total oil
Farnesene	< 1.0% of total oil
Humulene	7 - 12% of total oil



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Types of beer

Lagers

Bottom fermenting yeast (50 degrees)

Crisp, light, low fruit tastes

Range from pilsner to double bock

Ales

Top fermenting (64 – 72 degrees)

Malty, full-bodied, fruity

Pale ales to stout



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What's in my beer? - yeast

Yeast makes beer out of wort.

Style specific- Irish Ale, Belgian ales, Kosch, English Bitters. Good generic "clean yeast" like Fermentis US-05.

Pick a yeast that works in your fermentation environment (average temperature)

Yeast chart - <http://www.mrmalty.com/yeast.htm>, also provides yeast



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What's in my beer? - Lager Yeast

STRAIN: 2007
PILSEN LAGER™

Wyeast 2007 is the classic American lager strain. This mild, neutral strain produces beers with a nice malty character and a smooth palate. It ferments dry and crisp with minimal sulfur or diacetyl. Beers from this strain exhibit the characteristics of the most popular lager in America.

MEDIUM FLOCCULATION 71 - 75 ATTENUATION 48 - 56 TEMPERATURE RANGE 9 ABV

GOOD FOR STYLES:

 — LAGERS — American Lager VIEW STYLE DETAILS >	 — LAGERS — American Light Lager VIEW STYLE DETAILS >	 — LAGERS — Historical Beer: Pre-Prohibition Lager VIEW STYLE DETAILS >	 — LAGERS — German Pils VIEW STYLE DETAILS >	 — LAGERS — Schwarzbier VIEW STYLE DETAILS >
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


What's in my beer? – Ale Yeast

STRAIN: 1056
AMERICAN ALE™

Very clean, crisp flavor characteristics with low fruitiness and mild ester production. A very versatile yeast for styles that desire dominant malt and hop character. This strain makes a wonderful "House" strain. Mild citrus notes develop with cooler 60-66F (15-19C) fermentations. Normally requires filtration for bright beers.

LOW - MEDIUM FLOCCULATION 73 - 77 ATTENUATION 60 - 72 TEMPERATURE RANGE 11 ABV

GOOD FOR STYLES:

 — ALES — American Pale Ale VIEW STYLE DETAILS >	 — ALES — American Amber Ale VIEW STYLE DETAILS >	 — ALES — American Brown Ale VIEW STYLE DETAILS >	 — ALES — American IPA VIEW STYLE DETAILS >	 — ALES — Double IPA VIEW STYLE DETAILS >
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Why Homebrew?

You can make great beer

Economics \$36 for ingredients to make 2.5 cases

Fun hobby and great group activity

Make beers you like



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How is beer made?

Recipe

Steeping

Boiling

Cooling

Fermentation

Filter / Carbonation

Bottling and kegging



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Your Brew Session...

- Time
- Space
- Equipment
- Ingredients
- Brewing steps
- Enjoy



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Equipment – this??



1 bbl | Brewhouse

\$15,999.00

ADD TO CART

For Units Shipping July 2018



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Equipment – this??



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Your Brew Session – the recipe

Oscar's Pale Ale

- 8 oz Munich Malt
- 6 oz Carapils Malt
- 4 oz Caramel Malt (80 Lov.)
- 8.5 lbs Light Extract
- 0.75 oz Columbus Hops in Boil
- 1.0 oz Cascade Hops in at Mid
- 1.5 oz Centennial Hops in at 50 minutes
- 3.0 oz Columbus Hops in at Flame Out
- American Ale Yeast
- Muslin Bag
- Irish Moss
- ¼ cup Corn Sugar



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Your Brew Session - the instructions

Five Gallon Brewing Procedures

- 1) Place the cracked grains in the muslin bag(s) and place in a pot with 2 gallons of cold water. Add gypsum, if applicable. Bring the water temperature up to 150 degrees F. Steep the grains for 30 minutes, remove and discard the grains.
- 2) Add the extracts into the pot and stir to thoroughly mix the extract into the water.
- 3) Bring the liquid to a boil.
- 4) Add the boiling hops slowly to the pot.
- 5) At the 30 minute mark, add the Mid hops to the pot.
- 6) At the 45 minute mark, add the Irish Moss to the pot.
- 7) At the 55 minute mark, add the Finish hops to the pot.
- 8) At the 60 minute mark, remove the brew pot from the stove. Cool the wort using an ice bath or a wort chiller.
- 9) Transfer the chilled wort to a sanitized fermenter. Add enough cold water to bring the total volume up to 5 1/4 gallons.
- 10) When the temperature of the wort drops to below 85 degrees, add the yeast.
- 11) Place the airlock onto the fermenter.
- 12) After primary fermentation has completed, transfer the beer to the secondary fermenter. Add dry hopping hops, if applicable.
- 13) After secondary fermentation has completed, dissolve corn sugar in 16 oz. water, bring to a boil.
- 14) Transfer beer from secondary fermenter to bottling bucket. Add cooled priming sugar solution.
- 15) Transfer beer to sanitized bottles & cap. Allow 7-10 days for carbonization to complete.
- 16) Enjoy !!



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Key Things to Remember

Did I mention cleaning

Heat, air and light are your enemies

Keep it simple

Follow the process

Ask for help

As Charlie Papazian says enjoy a homebrew

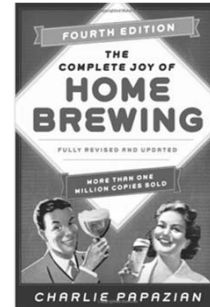


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Resources

- www.homebrewersassociation.org/how-to-brew/ (how to videos)
- www.mrmalt.com
- www.brewersfriend.com
- www.howtobrew.com



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