

# Forest City



# Brewers

Rockford, IL

Dedicated to the Art of Home Brewing

# The Barley Whispers

**Official Newsletter of the  
Forest City Brewers**

**May/June 2016 Edition**

Next meeting will be held at The Prairie Street Brewhouse

*Wednesday, June 1<sup>st</sup>, 2016 - 7:00 PM*

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## **May Meeting Recap**

As I was unable to attend last month's meeting, I do not have a recap from May. I encourage all of you who have interest to listen to the podcast on the club's website. See the link below.

<http://forestcitybrewers.org/podcasts.html>

## **Upcoming Beer Events**

### **Rockford Area Events**

#### **FCB Tasters' Guilds and locations:**

June – Olympic

July – Thunder Bay

August – Pig Minds

If you have any ideas about new places to go for upcoming Tasters' Guilds, please let us know at the meeting.

#### **Brewers Guild Information:**

Please stay tuned for upcoming Brewers Guild dates and locations. See Tim Lundquist if you'd like to volunteer to host.

#### **Ballpark Ale Fest – Saturday, June 4<sup>th</sup> at 7 PM**

The first ever Ballpark Ale Fest will feature over 80 Illinois craft beers with food and live music at the Rockford Rivets stadium. The event's founder, Josh Seago will be present at this month's meeting to talk about FCB participation. He will also be offering a \$5 discount to club members.

<http://ballparkalefest.com/>

### **Midwest Events**

#### **Chicago Ale Fest – Friday and Saturday June 17<sup>th</sup> and 18<sup>th</sup>, Chicago, IL**

Standard beer festival format at the second annual event: over 200 beers from over 100 breweries with food and music from local Chicago restaurants and musicians. Tickets are \$50/person and a portion of the proceeds go to the Grant Park Conservancy.

<http://chicagoalefest.com/>

#### **Door County Beer Festival – Saturday, June 18<sup>th</sup> – Bailey's Harbor, WI**

Sample over 150 beers from Door County and the upper Midwest. Food will be available, prepared by local chefs and festival goers will be treated to a live brass band in true Wisconsin style. Tickets start at \$40 per person. See the website for details.

<http://doorcountybeer.com/>

#### **Wisconsin Beer Lover's Festival – Saturday, June 18<sup>th</sup> – Glendale, WI**

DRAFT magazine and the Wisconsin Brewers' Guild are partnering for the nation's premier food and beer tasting event. Sample artfully paired beers and food from local restaurants and cheesemakers. Tickets range from \$25 to \$65.

<http://wisconsinbeerloversfest.com/beer-lovers-festival/info/>

### **National Events**

#### **National Homebrewer's Conference – June 9<sup>th</sup> through 11<sup>th</sup> – Baltimore, MD**

A reminder for all of you lucky enough to be attending that the conference is two weeks away. We expect a full trip report when you get back!

<http://www.homebrewcon.org/news/2016-register-now/>

## May Contest Results

### Open Contest

- 1<sup>st</sup> – Cory Ellis – Peach Berliner Weisse  
 2<sup>nd</sup> – Mike Bohn – Belgian IPA  
 3<sup>rd</sup> – Brian Lowry – Dry Cider

### **Honorable Mention:**

Tim Lundquist, Blake Aper, Joe Mongan, Ron Derry, Alex Cando, Tanner Young, Matt Skorniak, Tim Sage, Chris Giovingo, Jessica and Elliot Goodman

### Style Contest – SMaSH

- 1<sup>st</sup> – John Croak  
 2<sup>nd</sup> – Scott Walker  
 3<sup>rd</sup> – Tim Lundquist

### **Honorable Mention:**

Mike Bohn, Art Benedict, Blake Aper

## Upcoming Styles for 2016 (Categories are 2015 Guidelines)

- January – English Porter (13C)  
 February – Specialty Red IPA (21B)  
 March – Irish Red Ale (15A)  
 April – Fruit Beer (29A)  
 May – SMaSH American Pale Ale (18B)  
 June – Extract American Wheat (1D)  
 July – Spotted Cow Clone (34A)  
 August – Saison (25B)  
 September – Oatmeal Stout (16B)  
 October – Märzen (6A)  
 November – Mead (All “M” Categories)  
 December – Belgian Tripel (26C)

## Competition Corner

### Area Competitions

#### Local

As always, bring your beer to the club meetings for our monthly tasting competitions.

#### Regional/National

The AHA National Homebrew Competition for 2016 will be accepting beer applications from February 1<sup>st</sup> through February 7<sup>th</sup>. First round shipping is between February 29<sup>th</sup> and March 9<sup>th</sup>, with first round judging beginning on March 11<sup>th</sup>. Note the dates as your brew day to meet the shipping deadline is fast approaching.

For details on upcoming AHA sanctioned competitions, go to:

<http://www.homebrewersassociation.org/pages/competitions/aha-bjcp-sanctioned-competition/calendar>

## **Beer in the News**

### [Beer for Dogs?](#)

Even though this sounds like some real new-age hippie stuff, the idea is pretty cool. One company is making an NA beer tailored for man's best friend and introducing dog owners to a new way to bond with their pets.

### [Floating Brewery on Carnival Cruise Ship](#)

In case you were considering taking a cruise vacation, perhaps you should consider Carnival. The cruise line has launched the world's first sea-born brew pub. The beer has the potential to be utter rubbish, but their ambition is commendable.

### [Venezuela is Running Out of Beer](#)

As if you needed further proof that Socialism is bad news for humanity, Venezuela is running out of beer. What's worse is that the proletariat will have nothing to cry into as they mourn the collapse of their Marxist paradise (my words, not NPR's – Eric).

### [Researchers Discover 5,000 Year Old Beer in China](#)

Barley beer discovered in ancient potsherds shed light on the history and development of agriculture and trade in Asia five millennia ago. The surprising discovery pushes back the previously-accepted date of barley's introduction to China by 1,000 years.

## **Brewing Tips and Techniques**

As a companion to June's contest style, I've included a very nice in-depth article from a January, 2007 issue of *Brew Your Own* on the topic of extract brewing, specifically for all-grain brewers. Pay specific attention to the handy equations and quick reference at the end of the article. Enjoy.

-Eric

<https://byo.com/bock/item/614-extract-for-all-grainers-advanced-brewing>

# Extract for All-Grainers: Advanced Brewing

Author: Bill Pierce

Issue: [Jan/Feb 2007](#)

Even for all-grain brewers, malt extract has its uses. When making a strong beer or a large volume of beer, malt extract can substitute for mash tun volume (or boil time). Learn the equations to make expedient extract additions.

## Extract for All-Grainers

*Extracting the secrets of malt extract in your brewing*  
by Bill Pierce

Once a homebrewer switches to all-grain brewing, he (or she) will often avoid using malt extract, except perhaps for making yeast starters. The lure of doing things "from scratch" blinds them to a few circumstances when using malt extract can be very practical. Award-winning beers can be brewed using malt extract, as demonstrated by best-of-show winners I have judged at beer competitions. Moreover, we shouldn't forget the occasions when time or equipment limitations make using malt extract a reasonable and convenient choice. We wouldn't want to take the fun out of homebrewing.

Partial mash brewers are, of course, adept at making beers by combining wort from a mash and wort made from diluted malt extract. And many of the topics I discuss in this installment of Advanced Brewing will apply to both full mash brewers — whose mash tun size may not be adequate in all circumstances — and partial mash brewers.

### **Not so secret ingredients and process**

Malt extract comes in two basic forms, liquid malt extract and dried malt extract (often abbreviated to LME and DME). The process for producing both begins similarly: crushed grains are mashed in hot water in much the same way as in any brewery. Then the mash runoff, containing the sugars that have been converted from the malt starches, is collected and boiled in order to sanitize it, concentrate the sugars and precipitate proteins that can contribute to haze. However, unlike in brewing, the extract manufacturer boils the wort in a partial vacuum. You may recall that the boiling temperature decreases with the air pressure; for example, at higher altitudes water boils at a lower temperature. Extract is typically boiled at 100–120 °F (39–49 °C), which requires a significant vacuum.

The reasons for the lower temperature vacuum boil are twofold. Higher temperatures tend to promote oxidation, which can result in premature staling and off-flavors. This is not such a problem if the wort is intended to be chilled and fermented relatively quickly, but it can be an issue with a product that may not be used for several months or longer. Secondly, heat can darken the wort, a more important concern since extract will pick up some color in the process of concentrating it, and may be boiled again by the brewer.

The wort for extract is boiled for a longer time and concentrated to a much greater degree than if it were to be fermented right away. Liquid malt extract has the consistency of very thick syrup and typically has a water content of 20% and a specific gravity of about

1.450. (This can't be measured directly with hydrometers in the range that homebrewers use. You can however, find the specific gravity of your liquid malt extract by mixing one volume of liquid malt extract and 9 volumes of water, preferably distilled. Mix thoroughly, take the specific gravity and multiply the points by ten.) The wort for dried malt extract is boiled for a somewhat shorter time; the less dense syrup is then injected through a spray nozzle into a vessel at an even higher vacuum. The resulting pressure and temperature drop very quickly removes and freezes the water, leaving a fine dry powder with a moisture content of only about 1%.

Some liquid malt extract has hops added during the boil, but the vast majority of hopped extract is used only in kits. For our all-grain purposes, hopped extract is best avoided, so we can better control the bittering level.

Liquid malt extract may be canned or bulk packaged; it is relatively stable in terms of shipping and short-term storage, but it should really be considered a perishable product, as it is prone to staling and also darkening. Most homebrew shops and suppliers are known to turn over their stock frequently. If you can't get fresh liquid malt extract use dried liquid malt extract. If kept away from moisture, it will remain fresh for several years or longer.

### **Extract by the numbers**

Extract manufacturers provide color values for their light, amber and dark extracts, and these may be used in the same manner as grains in calculating the color of the resulting beer. (A full rundown of all extract specifications can be found in the October 2006 issue of *BYO*.) There is, however, little available information about the grain bill used in the production of many malt extracts. For light extract, it is safe to assume that only pale malt is used, but it is difficult to know the percentage and color of the crystal or caramel malt in amber extract and the roast grains used in darker extracts. For example, is an amber extract produced with 20% crystal malt (20 °L) or 5% dark crystal malt (120 °L)? For this reason, many advanced homebrewers prefer to use only light extract and to mash or steep the other specialty grains that contribute color and flavor to their beer. This allows far more precise control over the beer character and flavor. Information regarding the composition of wheat malt extracts is known, with the percentage of malted wheat varying in the 40–60% range. Likewise, some Munich malt extracts state the amount of Munich in them, usually 30–50%.

As mentioned, the boiling during manufacture darkens the extract somewhat, so it is true that no extract is quite as light in color as the palest malt. Even the palest extracts have color ratings of about 3.5 °L, as opposed to 1.5 °L for the lightest colored malted grains. However, adding the extract near the end of the boil can minimize the additional darkening of your beer. Because it has already been boiled, the long boil times required for all-grain beers are unnecessary for liquid malt extract.

Many manufacturers do provide values for the sugars in their extract. This is equivalent to the “extract potential” of grains, except that the sugars in malt extract can be considered 100% extractable. Extract potentials are based on that of pure sucrose (even though extract and wort contain a variety of sugars), which is accepted by convention to have a potential of 1.04621. In other words, 1.0 pound (0.45 kg) dissolved in 1.0 gallon (3.8 L) will have a specific gravity of 1.046 at the reference temperature of the measuring instrument (typically a hydrometer). The reason the average extract potential of light DME and LME — 1.045 and 1.036, respectively; you can use these values and achieve reasonable accuracy in the absence of those from the manufacturer — is lower than that of sucrose is the moisture content.

### **Down to the finish line**

The extract potential values for dried malt extract and liquid malt extract say nothing about fermentability and attenuation, that is, the percentage of sugars that can be digested by the yeast and the effect on the final gravity of the beer. Of course this is also true of malted grains; the maltster has no control over the brewer's mashing and fermenting conditions. However, with grain the brewer can vary the mash temperatures and times to produce more or less fermentable wort, while for malt extract, this has already occurred during manufacture. Evidence based on extracts from a number of manufacturers shows quite a variety in this respect. The average apparent attenuation when fermented with a neutral yeast strain can range from more than 75 percent to as low as 50 percent. This would mean that the final gravity of wort with an original specific gravity 1.048 could range from 1.012 to 1.024. A beer with the lower attenuation and higher final gravity values would have considerably more residual sweetness and body.



Therefore some discretion is clearly in order when brewing a 100 percent extract beer. Good homebrew shops and suppliers are knowledgeable about the extracts they sell, and can provide at least general guidelines about their fermentability, in addition to data from the manufacturers. Homebrewers can use this information, as well as their own previous experience, to select the extract best suited to their beer. For the all-grain brewing situations discussed next, extract is used to provide only a portion of the fermentables, resulting in less variability in terms of attenuation.

### **Quick and ready**

Why would a homebrewer who is committed to all-grain want to use extract? The answer lies in its great usefulness as a quick and ready source of sugars, especially for boosting the specific gravity or volume of the wort prior to the boil. Yes, corn sugar or pure sucrose (ordinary table sugar) can be used for the same purpose and is less expensive and even more widely available. However, sucrose and other simple sugars are so fermentable that they tend to reduce the body of a beer. Malt extract is a better way to raise the gravity without decreasing the body, and in fact can even be used to increase it if that is desired.

Brewers may need to increase the gravity or volume of their beers for a number of reasons. The first is when the specific gravity is below the target for the recipe. Even with experience and care, mashing is not always a totally smooth and predictable process. The variables and factors are many, and grain is occasionally of inconsistent quality. For these and other unpredictable reasons, it is entirely possible to come up short of the target. Homebrewers of the “relax, don’t worry, etc.” school may accept this as the outcome of fate, but others are less forgiving.

Secondly, malt extract can be a boon to high gravity brewing. Big beers require a lot of fermentable sugars, with the equipment capacity to match. Sometimes this means having to reduce the batch size in order to accommodate more grain and compensate for the longer boiling time and greater evaporation.

Augmenting the fermentables with malt extract may be the most, or sometimes the only, reasonable solution. For example, your mash tun may only have the capacity to mash enough grain for a 5.0-gallon (19-L) batch of a beer with a maximum original specific gravity of 1.080, yet you want to brew a 1.100 OG barley wine. On a larger scale, this problem is also faced by a number of commercial craft breweries when brewing their highest gravity beers.

Alternately, you may want to increase the batch size of a recipe, for example, in order to have enough beer to serve for a party or a meeting of your local homebrew club. For example, you may wish to brew 10 gallons (38 L) of beer rather than 5.0 gallons (19 L). Again, you may be limited by the capacity of your mash tun. In all of these cases, there is no need for despair. Having some extract on hand and knowing how to use it can remedy such problems in short order. (Of course, you may also need a bigger kettle or multiple kettles to boil all your beer.)

### **Doing the math**

If you can measure the wort specific gravity or volume with reasonable accuracy, it is not overly difficult to calculate how much extract is needed to raise the gravity a specified amount. (Measuring specific gravity and volume requires a hydrometer and thermometer, or refractometer, and a calibrated kettle or other brewing vessel.)

To calculate how much extract to add to raise the specific gravity from your actual gravity to your target gravity, use this equation:

$$W_{ex} = [V * (SG_{target} - SG_{actual})] / EP_{ex}$$

where  $W_{ex}$  is the weight of malt extract addition (in pounds),  $V$  is the volume of wort (in gallons),  $SG_{target}$  is the target specific gravity (in points),  $SG_{actual}$  is the actual specific gravity (in points) and  $EP_{ex}$  is the extract potential points of malt extract (in “ppg” or points per pound per gallon). Since the values for extract potential used by most homebrewers are in “ppg,”

I will work the examples in English units. You can also work with metric units if you use liters as your measure of volume and use a metric measure of extract potential.

It should be noted that the previous formula is for the weight of the malt extract rather than the volume. Despite the convenience of volume measurements, it is much more accurate to measure malt extract by weight.

### Three uses for malt extract

For our first example, let's say a recipe has a target pre-boil specific gravity of 1.050. After mashing and collecting the runoff, you find that the actual gravity is 1.040. The volume is 7.0 gallons (26 L). Using the formula for how much extract to add, you would calculate:

$$W_{ex} = [7 * (50 - 40)] / 45 = 1.56$$

$$W_{ex} = [7 * (50 - 40)] / 36 = 1.94$$

So, you would add either 1.56 lbs. (0.71 kg) of dried malt extract or 1.94 lbs. (0.88 kg) of liquid malt extract to boost your 7 gallons (26 L) of wort from a specific gravity of 1.040 to 1.050.

Probably the most common situation in which an all-grain brewer will use malt extract is when brewing a beer with an original gravity that exceeds what he can reach with wort collected from his mash tun. Or, it may be possible to reach the target gravity, but require a very extended boil. (This can apply to either all-grain brewers making big beers or partial mash brewers making most styles of beer.) For our example, let's say you wish to collect 7.0 gallons (26 L) of runoff for a barley wine and then boil it down to 5.0 gallons (19 L) with a specific gravity of 1.085. Let's further say that, after collecting your 7.0 gallons (26 L) of wort, your specific gravity is 1.055. To figure out how much extract to add, if any, you would first need to predict what your post-boil gravity will be, based on your pre-boil gravity. To do this, use the formula:

$$C1V1 = C2V2$$

where C1 and V1 are the concentration (in specific gravity points) and volume (in gallons), respectively, of the first solution, and C2 and V2 the concentration and volume of the second.

In our example,  $55(7) = X(5)$ . Solving for X yields  $([55(7)]/5) = 77$  — in other words a calculated post-boil gravity of 1.077. To increase the specific gravity to 1.085, use the previous formula:

$$W_{ex} = [5 * (85 - 77)] / 45 = 0.88$$

$$W_{ex} = [5 * (85 - 77)] / 36 = 1.1$$

So, you would either need to add 0.88 lbs. (0.40 kg) of dried malt extract or 1.1 lbs. (0.50 kg) of liquid malt extract to your 7.0 gallons (26 L) of pre-boil wort. Then, once your wort is boiled down to 5 gallons (19 L), you should hit your target gravity.

A final handy use of malt extract is when you want to brew a larger volume of a beer than your mash tun can provide wort for. So for our final example, let's say you want to brew 10 gallons (38 L) at a specific gravity of 1.048, but when you quit collecting wort, you have 8.0 gallons (30 L) at 1.044.

As before, the first thing you would do is predict your original gravity at your planned volume from the wort you collected, using the "CV" formula. In this case,  $44(8) = X(10)$  and therefore  $X = 35.2$ . In other words, upon adding water, you have enough fermentables for 10 gallons (38 L) of wort at SG 1.032. To reach your target gravity of 1.048, you would need:

$$W_{ex} = [5 * (48 - 32)] / 45 = 1.78$$

$$W_{ex} = [5 * (48 - 32)] / 36 = 2.22$$

Put into words, you would need to dilute your wort with water to its pre-boil volume, then add either 1.78 lbs. (0.81 kg) of dried malt extract or 2.22 lbs. (1.0 kg) of liquid malt extract. Upon boiling down to your target volume (10 gallons/38 L), you should also hit your target gravity (1.048). (Of course, when brewing more beer, your mash tun is not the only limiting factor. You may have to round up a larger kettle or split your wort and boil in more than one kettle.)

### **Pump up the volume**

Astute readers may ask about the increase in volume from the extract addition. With a typical water content of 20%, liquid malt extract has a calculated volume of 10.6 fl. oz. per pound (692 mL/kg). At first thought, the additional volume contributed by dried malt extract would seem negligible. However, it is real and measurable, and for those who are sticklers for accuracy, we will mention it here. When sugar is dissolved in water, there is an increase in volume. Because of molecular interactions, the formula is not strictly linear, and the result increases slightly along with the specific gravity of the solution. A very reasonable average value for the gravities used in brewing is 9.42 fl. oz. per pound (614.2 mL/kg). That is, 1.0 lb. (0.45 kg) of dried malt extract added to the wort will increase the volume by 9.42 fl. oz. (or 1.0 kg will increase the volume by 614.2 mL).

*Bill Pierce writes the Advanced Brewing column in every issue of Brew Your Own.*

### **The Extract Facts, Jack**

*Some handy facts for dealing with dried liquid malt extract.*

#### **Color**

dried malt extract: 3.5–5 °L

liquid malt extract: 4–6 °L

#### **Moisture Content**

dried malt extract: approximately 1%(\*)

liquid malt extract: approximately 20%

*(\* if left exposed to air, dried malt extract will continue to absorb water*

#### **Extract Potential**

The specific gravity of 1.0 lb. of malt extract diluted to 1.0 gallon of wort (or 121 g/L).

dried malt extract: 1.045

liquid malt extract: 1.033–1.037(\*)

*(\* in BYO standardized recipes, the lowest figure — 1.033 — is used.*

#### **Specific Gravity**

dried malt extract: not a liquid

liquid malt extract: approximately 1.450

#### **Weight per U.S. gallon**

dried malt extract:

very approximately 5.8 lbs. (0.69 kg/L)

liquid malt extract:

very approximately 12.0 lbs. (1.43 kg/L)

**Weight per 1 cup (8 fl. oz.)**

dried malt extract: very approximately 5.8 oz. (0.69 g/mL)

liquid malt extract: very approximately. 12.1 oz. (1.4 g/mL)

**Volume of 1.0 lb.**

dried malt extract: very approximately 2.75 cups or 22 fl. oz.

liquid malt extract: very approximately 1.3 cups or 10.6 fl oz.

**Volume of 1.0 kg**

dried malt extract: very approximately 1420 mL

liquid malt extract: very approximately. 700 mL

*Note: weighing extract is more accurate than using a volumetric measurement.*

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## **FCB Club Member Benefits as of June 2016**

- 10% discount on ingredients at Brew & Grow
- 10% discount on most items at Farmhouse
- 20% off your bill for one member and one guest at Lucha Cantina
- 20% off your entire tab at Pig Minds
- 50% off appetizers (with purchase of one beer) at The Olympic
- 50% off appetizers (with purchase of one beer) at Rockford Brewing Company (not on club night)
- 50% off food at Kryptonite until 9 PM