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BrewYour

JULY-AUGUST 2005, VOL.11, NO.4

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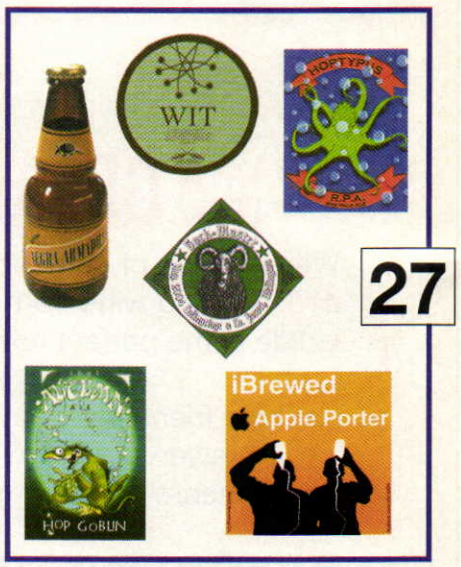
JULY-AUGUST 2005
Volume 11 Number 4

BrewYour Own

Departments

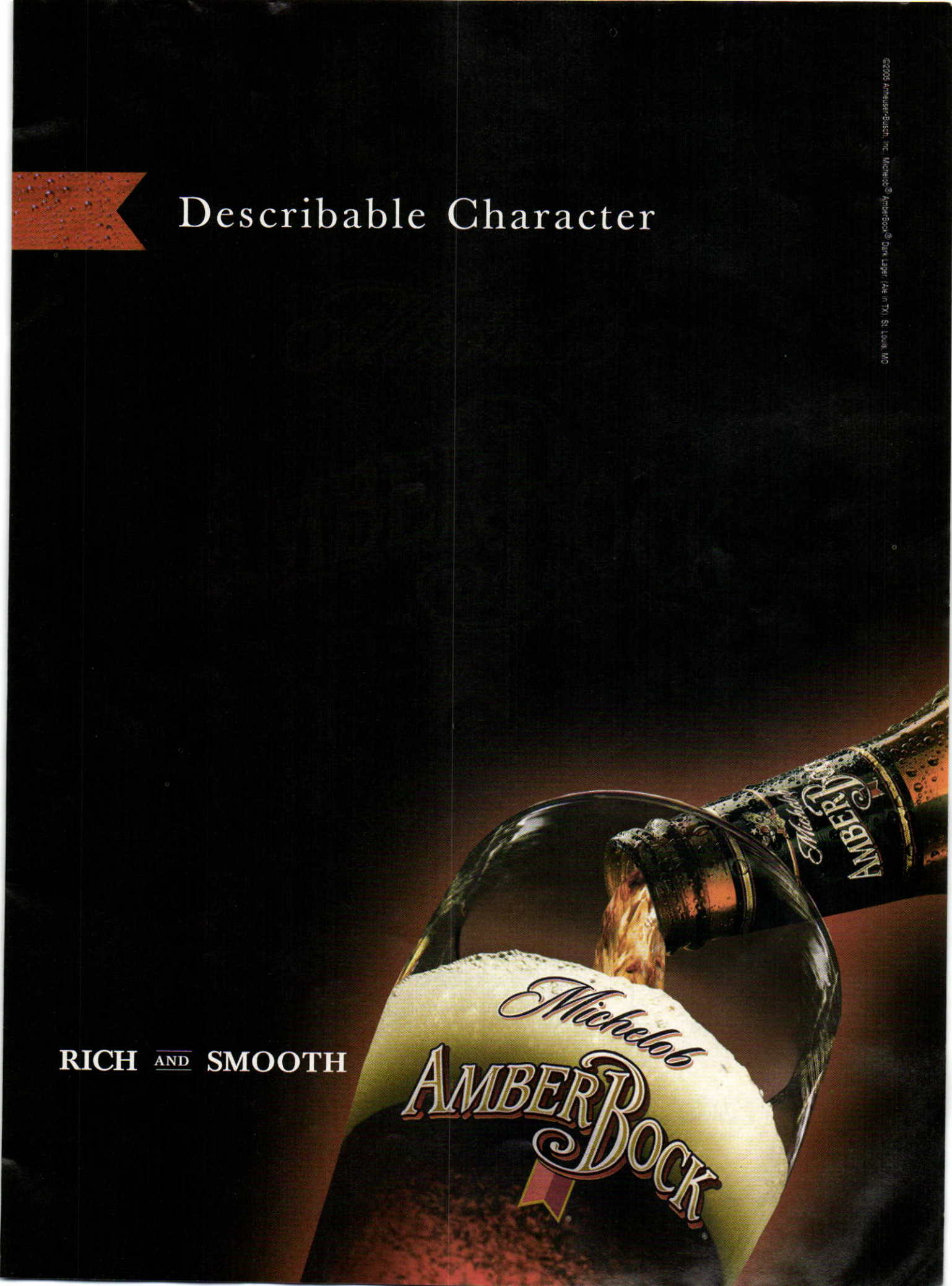
Features



Where to find it

COVER PHOTOGRAPHY: Charles A. Parker

Describable Character



RICH AND SMOOTH

RECIPE INDEX

BYO RECIPE STANDARDIZATION

Extract efficiency: 65%
(i.e. — 1 pound of 2-row malt, which has a potential extract value of 1.037 in one gallon of water, would yield a wort of 1.024.)

Extract values for malt extract:
liquid malt extract (LME) = 1.033–1.037
dried malt extract (DME) = 1.045

Potential extract for grains:
2-row base malts = 1.037–1.038
wheat malt = 1.037
6-row base malts = 1.035
Munich malt = 1.035
Vienna malt = 1.035
crystal malts = 1.033-1.035
chocolate malts = 1.034
dark roasted grains = 1.024-1.026
flaked maize and rice = 1.037-1.038

Hops:
We calculate IBU's based on 25% hop utilization for a one hour boil of hop pellets at specific gravities less than 1.050.

Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE

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Zero, My Hero

I am brewing the Sierra Nevada Pale Ale clone that is listed in the May-June 2005 issue of *BYO*. The second to the last hopping calls for 0.75 oz. of Cascade hops to boil for zero (0) minutes. I'm not sure if I don't understand this hop time or if this is a typo. Can you clarify this?

Paul Murphy
North Liberty, Iowa

In BYO *recipes, the times given next to hop charges are the times remaining in the boil, or — equivalently — the amount of time the hops are boiled. If it says "(0 mins)" next to a hop addition, this means the hops are added just as the boil is ending. If a time is not given next to a hop addition, it may be labeled "dry hop," which are hops added to the fermenter. Another possibility is "FWH," for first wort hops — hops added to wort before the boil begins.*

Orval Oops

In your May-June 2005 issue, you have a recipe for an Orval clone, which I want to brew. I just noticed that it says "At the end of the boil, add last charge of hops," but it does not include these hops in the ingredients list. It does have hops for 60 min, 15 min and dry-hopping, but not for the end of the boil.

James Roth
Hastings, Minnesota

The hop additions listed in the "Ingredients" section give the correct amounts and times. The instructions in the "Step by Step" section reference a hop addition at the end of the boil that doesn't exist. BYO *apologizes for any confusion. Incidentally, the website www.orval.be contains quite a bit of information on how their beer is brewed.*

Trappist Trip-Up?

As a fan of Belgian beers, I was excited to see a clone recipe for one of my favorite beers, Orval Trappist Ale. However, I wondered if there might be a mistake in the recipe statistics. The final gravity (FG) listed is 1.002 — did you mean 1.020? If not, where did you get this information?

Patrick Montgomery
Wilkes-Barre, Pennsylvania

The final gravity of Orval was determined by decarbonating a sample of the beer — quite a chore given the level of carbonation in this beer — and taking a hydrometer reading. The low final gravity is partially due to the relatively large amount of sugar added to the kettle; sugar ferments completely and adds strength to the beer, but no added body. The addition of yeast strains other than beer yeast — specifically, the Brettanomyces *yeast — also plays a role in lowering the final specific gravity.*

The Duvel is the Details

In the Duvel clone in the May-June issue of BYO, corn sugar is listed three times in the recipe. The one in the middle says "dosage" next to it. I'm not familiar with this term.

John Nelson
Omaha, Nebraska

In the Duvel clone, some sugar is added during the boil. Later, an addition of sugar is made to the fermenting beer in the secondary fermenter. This is the dosage sugar. Adding the sugar at two different stages ensures that the yeast are never overwhelmed by the amount of sugar at any point. It also mimics how the brewers of Duvel make their beer. Like Orval, Duvel has a website (www.duvel.be), although it contains fewer details about their brewing than the Orval site has.

Only Pale in Pilsner?

Every clone recipe I've ever seen for Pilsner Urquell used Pilsner malt and maybe some CaraPils along with it. Yet, in your 10 Classic Clones story (May-June 2005), the PU clone contains both Vienna and Munich malt and I was curious about this. Is this based on some new, previously undiscovered, information? Has the brewery changed their recipe? In your Sierra Nevada Pale Ale clone, you noted that your hop information came from new information off their website. So, I'm guessing there's a reason for the inclusion of the darker base malts.

Lance Mitchell
via email

To the best of our knowledge, Pilsner Urquell uses only pale malts — that they malt themselves — in their formulation. They do, however, employ a triple decoction mash and boil their wort for 2.5 hours. A combination of their malt and procedures yields a deep golden beer (around SRM 6) that is somewhat darker than many modern Pilsners .

A grain bill of only pale malt would not give homebrewers the correct color depth for their clone. So, we added some of the more highly-kilned Vienna malt and a small amount of Munich malt, which is a little darker still, to the grain bill. At the amounts they are used, these malts will give you the right color in your PU clone.

When preparing the story, we did assemble a "full-on" version of the

Pilsner Urquell clone, using only Pilsner malt and CaraPils. However, it got cut for space reasons. If you're interested, here it is:

Pilsner Urquell clone

(homebrew hero version)
(5 gallons/19 L, all-grain)
OG = 1.048 FG = 1.014
IBU = 40 SRM = 6 ABV = 4.4%

Ingredients

9.25 lbs. (4.2 kg) Pilsner malt (undermodified or less modified)
0.5 lbs. (0.45 kg) CaraPils malt
8.75 AAU Cluster hops (60 mins) (1.3 oz./38 g of 6.5% alpha acids)
3.75 AAU Saaz (Zatek) hops (15 mins) (0.93 oz./27 g of 4% alpha acids)
0.75 oz. (21 g) Saaz (Zatek) hops (0 mins)
1 tsp Irish moss
Wyeast 2001 (Urquell Lager) or White Labs WLP800 (Pilsner) yeast (3 qt./3L yeast starter)
0.75 cups corn sugar (for priming)

Step by Step

Using very soft water, perform a triple decoction mash with 15 minutes rests at 122 °F (50 °C) and 140 °F (60 °C) followed by a 45 minute rest at 158 °F (70 °C). Stir in boiling water to raise temperature to 168 °F (76 °C) and let mash settle for 5 minutes. Recirculate wort for 20 minutes, then begin running off wort. Sparge with water hot enough to maintain grain bed temperature at 168 °F (76 °C). Add enough water to wort so that after boiling lightly for 2.5 hours, you end up with 5 gallons (19 L) of wort. (You may need to top up the wort during the boil a few times.) Boil wort lightly for 2.5 hours. Add bittering hops with 60 minutes left in the boil. Add Saaz (Zatek) hops at 15 minutes and at knockout (when the heat is turned off). Add Irish moss with 15 minutes left. Cool wort and transfer to fermenter. Aerate well and pitch yeast. Ferment at 53 °F (12 °C) and lager at 40 °F (4.4 °C) for at least 5 weeks.

Starter on Steroids

In your article about the 10 Classic Clones (May-June 2005), the instructions you gave for making a starter were somewhat incorrect. You stated to use 6.2 oz. of dried malt extract (DME) per quart of water, and that it would yield a starter wort gravity of 1.035. The potential extract of a pound of DME is 1.044, so 6.2 oz. would create a starter wort around SG 1.068, which is much too high for a normal yeast starter for a average gravity beer.

Dan Schlosser
via email

You're right. The instructions actually give twice as much dried malt extract as is needed. If followed, the resulting starter would have a specific gravity around 1.070. Although your yeast would grow in this starter, it would be better to raise the yeast in a lower-gravity starter. This puts less stress on them prior to the main fer-

mentation. Using 3.1 oz. (88 g) of dried malt extract per quart (~ 1 L) of starter will give you a starter around a specific gravity of 1.035.

Lysozyme

I wanted to say thanks for the help that was given in your response to my email question that was posted in the March-April 2005 issue labeled "Contaminated Cornies." The response as well as the follow up in the following issue was very informative and helpful indeed. I did, however, have one other question about the article. You had mentioned the use of "lysozyme." I'm not familiar with this substance — could you elaborate on this. Thanks again for your help!

Steve Gambrell
via email

Lysozyme is an enzyme, commercial preparations of which are extracted from egg whites, that kills certain kinds of bacteria. Lactic acid bacteria, the bacteria that lead to sour beer, are one kind of bacteria destroyed by this enzyme. Lysozyme is also used by winemakers and is available at most home winemaking shops. Used in the proper amounts, it contributes no taste to beer.

Stunted Stout?

I was wondering if the amount of LME (2.66 lbs.) and DME (0.66 lbs.) given for the Murphy's Stout clone (January-February 2005 BYO) are the right amounts? The guy where I buy my ingredients suggested that amount of malt wasn't enough so I got 6.6 lbs of LME. I haven't brewed yet so I just wanted to check and make sure. Love your magazine!

John Horsman
via email

Yes, those are right amounts. Dry stouts usually have an original gravity around, or just under, 1.040 and the amount of extract (combined with the fermentables from the grains in the recipe) will give you the correct starting gravity. Because of their bold flavors, many people think of stouts as big or strong beers. There are, of course, strong styles of stouts — but dry stouts start at a low gravity and ferment to rather low final gravities, giving them a dry finish.

Don't Panic

I just tried my first batch. It has been 48 hours and no bubbles appear in the air lock. Should I be concerned?

Sam Horner
via email

Take a look inside your bucket. If there is kraeusen (foam) on top of your beer, you're fine.

brewer PROFILE

Larry Bristol • Bellville, Texas

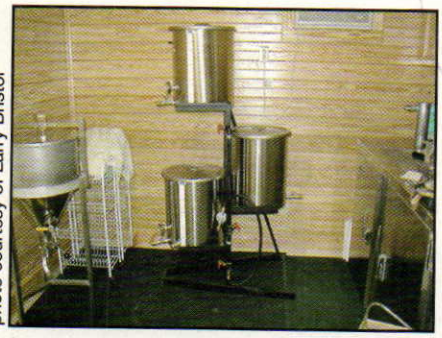


photo courtesy of Larry Bristol

Larry's HERMS brewery houses three kettles. On top is the mash/lauter tun, then the boil kettle and on bottom is his liquor tank.

My name is Larry Bristol, and I'm the head honcho at a place known as the Double Luck (www.doubleluck.com). That fact (plus one dollar and fifty cents) will buy me a cup of coffee at almost any airport in the country! I guess being head honcho isn't what it used to be.

In 1982, a friend of mine returned from Scotland. He told me of many quaint local customs, and a wonderful native drink that the locals enjoyed and held in high esteem — beer. Incredibly, after a little search, we found that the ingredients to make this exotic libation were readily available in the U.S.

On April 1 of that year I began an odyssey that was to change my life! My first attempt was to brew a style called stout. While my concoction did not capture all the subtleties of the native drink, I deemed it a success. Over the years, the techniques I use to create this beverage have gone through several evolutions. At first, I produced with a kit then began to modify the kits by adding other ingredients.

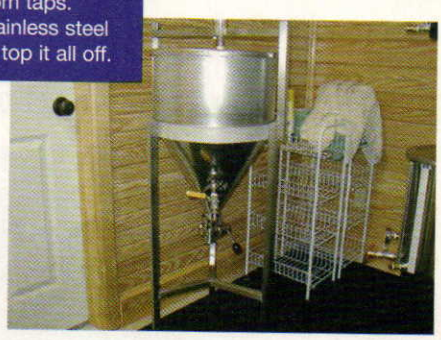
I was not alone in my interest and fell in with a group of like-minded individuals. Calling ourselves the Foam Rangers, we shared our creations, discussed how they were made, and before we knew it, would be laughing and singing, performing the ritual dances and putting on the full native costumes.

In 2001 I picked up and moved, and began brewing in a completely new place. I acquired a new system. It consists of a model B3-1500 brewing structure with three 14-gallon (53.2-L) stainless steel kettles.

From top to bottom, these are the mash/lauter tun, boil kettle and liquor tank. It is a manually controlled "heat exchange recirculating mash system" or better know as a HERMS.

A few years ago, a friend of mine gave me a Perlick commercial beer cooler he had used as backup for his restaurant. It was in poor condition, and he was willing to sell it for a song. After three choruses of "Hello My Baby" I loaded it into the back of my pickup.

Another friend, an expert in refrigeration, brought it back from oblivion and yet another friend gave me a beer engine as a gift. I can now make cask-conditioned ales for him (and me too). With all these friends, perhaps you start to understand why I use the name Double Luck!



left: Larry's refurbished commercial beer cooler with custom taps.
right: A stainless steel conical to top it all off.

homebrew CALENDAR

July 13
Commander SAAZ Interplanetary Homebrew Blastoff
Melbourne, Florida

This homebrew and mead competition is sponsored by the Spacecoast Associates for the Advancement of Zymurgy (SAAZ) and will be held at the Eau Gallie Civic Center in Melbourne. Beers will be judged in accordance with 2004 BJCP style guidelines. Fees are $5.00 per entry and please send two bottles per entry. The coveted Commander SAAZ Cosmic Trophy is awarded to Best of Show Winning beer and Best of Show mead/cider winners each year. The competition will be held on Saturday 23 July. For more information contact Don Ferris at Prez@Saaz.org or visit the SAAZ Website at www.saaz.org.

July 18
New York State Fair Home Brew Competition
Syracuse, New York

All BJCP beer styles for homebrew competition will be judged in this competition. The following rules apply: The competition is open to amateur homebrewers, 21 years old or older who are residents of New York State, entry fees and forms must be received on or before July 18 and beers must be received no later than July 22, fees are $8 for first entry and $5 for each additional entry, two bottles per entry. Mail entries to New York State Fair Home Brew, Art and Home Center, 581 State Fair Boulevard, Syracuse, NY 13209. For more information visit www.hbd.org/scbc/competitions.html.

July 27
Oregon State Fair Homebrew Competition
Salem, Oregon

The due date for entries is July 27 and judging will take place August 6. Standard BJCP categories, plus soft drinks will be judged, along with a homebrew label competition. The awards ceremony will take place on Opening day of the Fair, Friday, August 26. For more information contact Joanne Robinson at (503) 947-3223 or visit the Website at www.oregonstatefair.org.

homebrew CLUB

Hudson Valley Home Brewers • Poughkeepsie, New York

The Hudson Valley Home Brewers club was founded in 1989 by Bruce and Gloria Franconi. They owned a party supply store in Red Hook, New York and had quite a few friends who were into homebrewing. The store was converted into a homebrew shop and the club's first meeting was in St. Christopher's church basement in Red Hook. Approximately 15 members attended that first meeting and the no-name brew club was formed. A couple of months later the name was changed to the Hudson Valley Home Brewers. By the mid 90's the club had grown to 150 members but that number had dwindled down to 38 by 2000. We are now seeing resurgence and the club is back up to 88 members. We hold our meetings at The River Station Restaurant in Poughkeepsie on the second Wednesday of each month at 8 p.m. and invite anyone who is interested to come sit in. We usually have a professional brewer speak about one aspect of the brewing process or have a professional judge from the Beer Judge Certification Program (BJCP) discuss a specific style. We are trying to get a vintner to our next meeting and may do a homemade wine demonstration.

We have an annual homebrew competition in March, a picnic in June, an anniversary party in November and of course, a Christmas party in December. Another fun thing we do is an apple pressing in September and October to show people the process of making farmhouse cider.

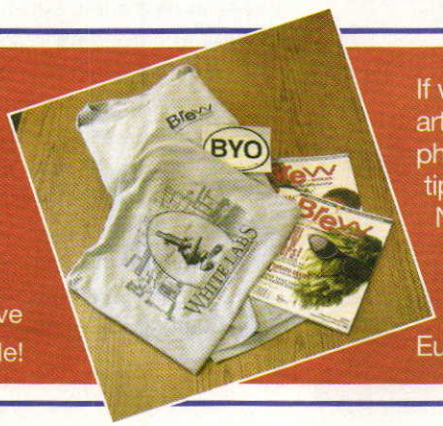
We were also part of the Tavern Day's Celebration at Van Cortlandt Manor in Croton-On-Hudson (this is the site of an 18th century tavern) where we did a running presentation of how the early settlers were able to make their own beer. Next year we plan to actually brew some of the historical society's old recipes.

In the midst of all of these events and meetings, we go on one big trip a year to a faraway place. This year we made the journey to Belgium and next year we will visit England, Scotland, Germany and Austria. Above all, we are committed to promoting and teaching the craft of homebrewing to the general public. It is our mission statement and our reason for forming in the first place. We hold homebrew demo's about four times a year and teach the art to the new and curious. We have been teaching a class in beer appreciation and administer a test for the BJCP each year. Visit us online at www.hbd.org/hvhb.

top and bottom: Members of the Hudson Valley Home Brewers at their 15th annual homebrew competion at Hyde Park Brewery in Hyde Park, N.Y.

we want you

Do you have a system or some unique brewing gadgets that will make our readers drool? Email a description and some photos to **edit@byo.com** and you too may have a claim to fame in your brewing circle!



If we publish your article, recipe, photos, club news or tip in Homebrew Nation, you'll get a cool t-shirt (courtesy of White Labs) and a *BYO* Euro sticker.

big winning RECIPE

Corey Martin
Austin, Texas

Best of Show winner for 2005 Austin ZEALOTS Homebrew Inquisition.

Lambic Thing #4

(5 gallons/19 L, all grain)
OG = 1.065 FG = 1.000

6.5 lbs. (2.9 kg) Belgium Pils malt
3.5 lbs. (1.6 kg) Americam white wheat
4.5 oz. (128 g) maltodextrin
1 oz. (28 g) Liberty hops
1 pint Belgium raspberry puree (5 min)
White Labs WLP001 (California Ale) Yeast
Wyeast 4733 (Pediococcus Cervesiae) lactic acid bacteria
Wyeast 3526 (Brettanomyces lambicus) wild yeast
Wyeast 3112 (Brettanomyces bruxellensis) wild yeast

Step by step:

Single infusion mash at 150–152 °F (~66 °C). Fermented with White Labs WLP001 (California Ale) for 2 weeks. Transferred to secondary and pitched Wyeast 4733 (Pediococcus) lactic acid bacteria. Two weeks later pitched with Wyeast 3526 (Brettanomyces lambicus). Six months later, added 4 cups hefeweizen wort with an OG 1.055. Three months later pitched with Wyeast 3112 (Brettanomyces bruxellensis). Three months later added 2 cups dopplebock wort with an OG 1.078. Five months later, kegged with a sequential "Lambic Thing #5" on top of the dregs that were left behind. It turned out good and sour!

reader PROJECT

Mark Gill • Shoreham, New York

After reading your September 2002 article on building a drafterator from an old dorm fridge and some left over MDF, I would lie if I were to say I wasn't excited. It had been a dream of mine to go home after a long day of classes and sit back and enjoy a fresh homebrew from my very own tap. Once I finally committed to purchasing a keg set up, I found a quite reasonability priced outfitter for my kegging needs. The next day I came to the realization "Wow I just shelled out a bunch of money! Now I'm obligated to build this thing."

Once my supplies were gathered and my box was built and primed I began cutting the holes in the refrigerator. With a hole saw in hand, I started to drill the first hole into the side of the dorm fridge.

I basically followed all the instructions of the article with the exception of installing my taps in the side of the fridge so I could use the door to store specialty grains and bottled homebrew. I also widened the top of the keg containment box with a slight over hang so I could install a homemade drip tray with room to spare. I decided to have the fan blow air down from the fridge into the keg box.

Another addition I made was to install an indoor/outdoor temperature gauge. It cost about seven bucks and it has a long wire with a sensor on it so you know how cold it is in the cabinet without opening doors and "losing your cool." The temperature gauge is nice because it allows you to note how consistent your temperatures are when lagering. Even though I'm not the biggest lager fan, I am presently lagering because . . . well just because I can! My next plans are to make a tap handle and possibly add another tap so I can make black and tans.

top: The tap is mounted on the side of the fridge so supplies can be stored in the door.
middle: There's enough room in here for a keg and a lagering carboy.
bottom: Thermometer and custom drip tray.

replicator

by **Steve Bader**

Dear Replicator,

At the Great American Beer Festival, I had the opportunity to taste a very flavorful and unique beer. It was brewed by Matt Cole at Rocky River Brewing Company (Ohio) and the beer was a chocolate coffee stout called Chocolate Jitters. After talking to Matt a bit about the beer, he said it was two recipes that he blended together. Can you replicate this for homebrewers?

Jason Pinkowski
Milwaukee, Wisconsin

Coffee, chocolate and beer? Sign me up! I could probably drink this all night and not bother with sleeping. I can feel the caffeine and alcohol buzzing through my veins! Lucky for you, Matt Cole happens to be one of *BYO's* Editorial Review Board, so it was a breeze getting you a recipe.

Matt combined their Oompa Loompa Chocolate Stout and Merlin's Black Magic Coffee Stout to come up with this recipe. Both of these beers have earned Silver medals at the Great American Beer Festival. Matt suggests you melt the chocolate in a double boiler, being careful not to burn the chocolate. Then the melted chocolate is added to the boil. When adding the vanilla bean, add it to the secondary fermenter and let the flavors develop over about a week, very much like dry hopping. To add the coffee flavoring, use cold-brewed coffee. Cold brewed coffee is about two-thirds less acidic than the traditional high temperature brewed coffee, lending to a smoother flavor in your coffee and beer. For more information visit the Website at: www.rockyriverbrewco.com or call the brewery at (440) 895-2739.

Rocky River Brewing Company Chocolate Jitters

(5 gallons/19 L, extract with grains)

OG = 1.071 FG = 1.018
IBU = 21 SRM= 49 ABV = 7.0%

Ingredients

6.6 lbs. (3.0 kg) Coopers unhopped light malt extract syrup
0.75 lbs. (340 g) Coopers light dried malt extract
1.0 lbs. (454 g) Munich malt (dark, 20 °L)
1.0 lbs. (454 g) Munich malt (light, 10 °L)
0.75 lbs. (340 g) aromatic malt
0.44 lbs. (200 g) Weyermann Carafa® III malt (500 °L)
0.44 lbs. (200 g) chocolate malt
0.75 lbs. (340 g) lactose (milk sugar) (60 min.)
2.5 oz (70 g) Belgian chocolate (melted)
Half of a whole vanilla bean (add to secondary fermenter)
3.3 AAU Tettnanger hops (60 min) (0.75 oz./21 g of 4.5% alpha acid)
3.3 AAU Tettnanger hops (30 min) (0.75 oz./21 g of 4.5% alpha acid)
1.0 AAU Liberty hops (in hopback) (0.25 oz./7 g of 4.0% alpha acid)
Wyeast 1007 (German Ale) or White Labs WLP029 (German Ale/Kölsch) yeast
20 oz. Jamaican Blue coffee (cold brewed, add at bottling)
0.75 cup (180 mL) of corn sugar (for priming)

Step by Step

Steep the crushed malts in 3 gallons (11 L) of water at 152 °F (67 °C) for 30 minutes. While the malts are steeping, melt the Belgian chocolate in a double boiler. Remove grains from wort, add the malt syrup, lactose, Belgian chocolate and bring to a boil.

Add the first addition of Tettnanger bittering hops and boil for 60 minutes. Add the second addition of Tettnanger hops for the last 30 minutes of the boil. Add the Liberty hops for the last 5 minutes of the boil. Now add wort to 2 gallons (7.6 L) of cool water in a sanitary fermenter and top off with cool water to 5.5 gallons (21 L). Cool the wort to 75 °F (24 °C), aerate the beer and pitch your yeast. Allow the beer to cool over the next few hours to 68 °F (20 °C) and hold at this temperature until the beer has finished fermenting. Transfer the beer into another carboy (called a secondary fermenter) and add the vanilla bean to the beer, and age for about another week. Cold brew 20 oz. (590 mL) of coffee for 24 hours, add the coffee to your beer, bottle and enjoy!

All-grain option:

This is a single step infusion mash. Replace the malt syrup and dry malt extract with 11 lbs. (5.0 kg) of pale malt. The rest of the grains used are the same as the extract recipe. Mash the grains together at 152 ° F (67 °C.) for 60 minutes. Collect approximately 7 gallons (26 L) wort to boil for 90 minutes and have a 5.5-gallon yield (21 L). Lower the amount of the Tettnanger hops in the first addition of the boil to 0.75 ounces (21 g) to account for higher hop utilization of a full boil. The remainder of the recipe is the same as the extract.

Email your Replicator requests to steve@baderbrewing.com!

Stuck Fermentation

Diagnosing problems when brewing stalls

by **Garrett Heaney**

The first step to solving any problem (aside from prevention of course) is a proper diagnosis. To determine the proper method of dealing with a stuck fermentation, a brewer first needs to figure out why his wort stopped fermenting and how far along the brew actually made it into the process.

There are several reasons why fermentations stall but these four are most common: inadequate temperature conditions, faulty yeast, wort quality and lack of oxygen. Depending on the degree of fermentation that took place before it stalled, your plan of attack will vary. There are basically three stages of fermentation: early, middle and late (or almost complete). To determine the degree of your stuck fermentation, you need to use your hydrometer to measure the progress and determine how far away your target gravity is.

Stuck early

If your beer has stopped early in fermentation — that is, if your fermentation has not made it at least a third of the way from the original gravity to your target gravity — your temperature may be too cold and stifling your yeast's ability to work. Check your yeast strain's temperature specifications and bring your fermentation to a temperature at the upper end of this range. You can do this either by physically moving the fermenter to a warmer location or by using a heating belt. After bringing the fermentation temperature to a more suitable level, stir the yeast sediment and see if it takes.

Lack of oxygen may also be the problem, so aerate the wort by shaking the fermenter, splashing the brew back and forth between two buckets or preferably by injection through an aeration stone. Of course, it is favorable to avoid this problem before getting stuck in fermentation, so do your best to eliminate the problem by being diligent about aeration when you start the brew.

If the prior two actions produce little or no results, you need to add a full dose of yeast and yeast nutrient. As a general brewing rule, check your fermentation's progress frequently, as you'll have the best chance at reviving a stuck fermentation the earlier you catch it. When you do run into a stuck fermentation it is important to act fast. The longer your partially fermented wort sits without active yeast, the less of a chance you will have at creating a decent beer.

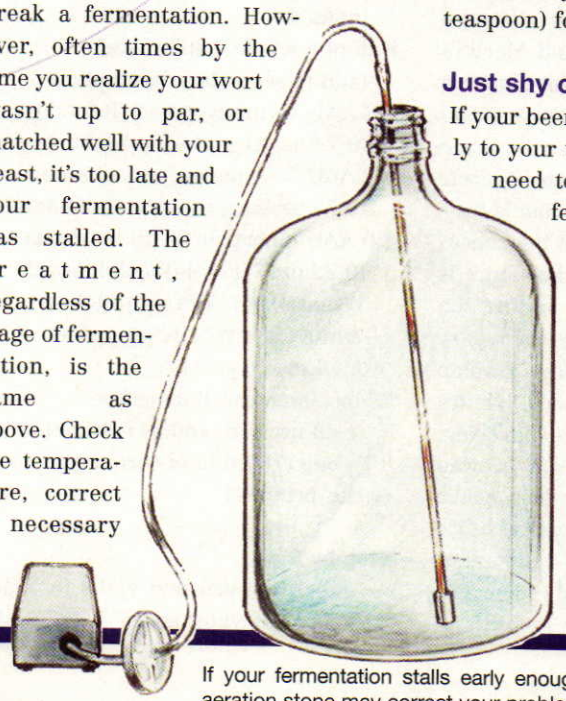
The quality of your wort can pose its own problem. The original gravity of your wort, its nutrient content and its ionic makeup (such as zinc content) are all factors that can either make or break a fermentation. However, often times by the time you realize your wort wasn't up to par, or matched well with your yeast, it's too late and your fermentation has stalled. The treatment, regardless of the stage of fermentation, is the same as above. Check the temperature, correct if necessary and repitch some yeast to get your brewing back on the right track. The only variance when it comes to correction is the amount of yeast to pitch. If it's early, you are going to want to pitch a second full dose, if it's in the middle or late, you will only need to pitch in the amounts described in the treatments that follow.

Stuck in the middle (with brew)

If your fermentation has made it more than halfway, you can also try to correct the temperature and re-pitch some yeast, but by no means should you aerate at this time. Aeration of wort that has fermented to this point will lead to oxidation, diacetyl and other off flavors in your finished brew. It is worth the time to make a yeast starter as the addition will be most effective if the yeast are vigorous when entering the stalled wort. A 2-quart (2-L) starter for a typical 5-gallon (19-L) batch should be ample to get fermentation reset and take your brew to finish. Include a yeast nutrient (about a ¼-teaspoon) for good measure.

Just shy of the mark

If your beer makes it almost completely to your target gravity and you only need to take the gravity down a few points, you are in luck. Not only will it be a simple fix, but the final brew will most likely turn out much better than a beer that got stuck earlier in the process. The treatment will be the same repitching of a yeast starter, only a smaller dose of about a pint (½-L) and an ⅛-teaspoon of yeast nutrient to ensure its health.



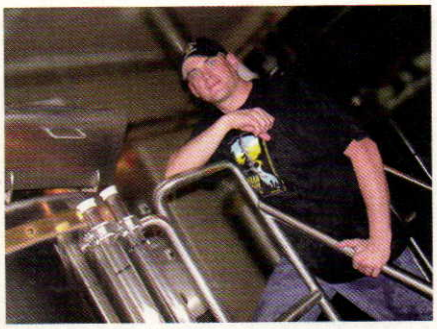
If your fermentation stalls early enough, an aeration stone may correct your problem.

Diagnosing Bad Beer

Determining the problem is half the answer

by Thomas J. Miller

Some of us might ignore obvious flaws in our homebrews, chalking it up to equipment limitations, other time commitments or the "relax, don't worry, have a homebrew" rule. But if you're serious about reaching the level of winning homebrew competitions, amazing your significant other or even landing a full-time brewing job, then it's time to diagnose your beers and learn how to fix them. This issue's pros will get you started.



Matt Cole is the head brewer at Rocky River Brewing Company in Rocky River, Ohio. He has been homebrewing since 1993 and attended the Siebel Institute Short Course in brewing. He has designed over 70 different beers since Rocky River opened in 1998.

brewers often use the phrase "cleanliness is next to godliness." This is something all brewers must accept and respect. The best of the best religiously check and recheck their work, adhering to strict sanitation and proper cleaning procedures. However, problems do arise and we must understand how to pinpoint and address them. Here are some possible problems that can arise in your brewery.

DMS can produce unpleasant sulfur tones similar to cooked vegetables or creamed corn. The most common occurrence of DMS is produced during malt kilning, wort boiling and wort cooling. DMS is released during boiling as a gas, which is dissipated into the atmosphere. This is the reason for a vigorous rolling boil of at least 60 minutes. Improper cooling techniques also lead to DMS production. Force-cooling the wort helps establish a more complete break (reduced trub levels) and reduces DMS development. The wort must be cooled rapidly, within 45 minutes to reduce DMS precursors.

Another common beer problem is oxidation. Oxygen quickly stales finished beer, yielding papery-tasting compounds, reducing malt character, accelerating diacetyl formation in beers that have not been aged properly and dulling hop character. While yeasts are good antioxidants, they cannot overcome the large amount of oxygen that is picked up during shoddy brewing and racking techniques. Oxygen and aeration are two distinctive things. It is important to comprehend which is which.

Aeration is the addition of oxygen to the cooled wort. Oxygen must only be applied when the temperature is cooled below 75 °F (24 °C). Aeration of hot wort causes the oxygen to chemically bind to wort compounds. These oxygen compounds can then oxidize the alcohol and hop compounds into off flavors and aromas such as papery, cardboard or sherry-like flavors. Mash pH is critical for proper enzymatic reactions and appropriate hot and cold breaks. Final runnings are also critical to monitor — discard any last runnings that drop below 1.008–1.010. These runnings may have a high level of polyphenol content and can lead to bad taste and haze in your beer.

Also, oversparging or sparging too hot can lead to the extraction of polyphenols and tannins from the malt. Care must be taken to keep sparge temperatures under 175 °F (79 °C) or off flavors can occur. Likewise, beers contaminated with bacteria may rapidly go turbid and develop a biological haze depending on the bug, though clean beers when stored for an extended period of time may also become cloudy and deposit a haze. Sugars like honey and molasses tend to develop haze over time if they are not used properly. This is due to the presence of complex proteins and polyphenols.

Besides running your beer through a filter, there are an assortment of ways to get a brighter brew. One approach is a vigorous rolling boil of at least 90 minutes, preferably 2 hours, supplemented with an addition of Irish moss or an equivalent kettle fining. Be sure to whirlpool in the kettle by stirring the wort in a circular clockwise motion at the end of the boil. This will help precipitate proteins and hop solids to settle in the center of the kettle. Many homebrewers use a "chore boy" wrapped in a muslin sack to trap solids. There are also various fining agents that can be added after fermention to help clarify the brew. The two most popular are isinglass and gelatin. These agents help bind with positive charged proteins, pulling them out of solution and falling to the bottom.

A preventative method is to choose a yeast strain that is highly flocculent. These strains tend to fall out quickly and naturally. The yeast will go dormant and fall to the bottom of the vessel, and will have a tendency to drag any remaining haze factors with it.

GREAT LAKES BREWING CO.
CLEVELAND, OHIO

Brian Lottig completed an M.S. in Brewing and Distilling at Heriot-Watt University in Edinburgh, Scotland. He has been the Director of Brewing and Quality Control at Great Lakes Brewing Co. since 2000.

One major flaw that can be diagnosed in "bad beer" is diacetyl. Diacetyl is a flavor-active compound that is a natural by-product of amino acid metabolism during fermentation. The flavor and aroma of diacetyl have been described as buttery, butterscotch and stale milk. If any of these qualities are evident in your beer, chances are you have a diacetyl issue. In a standard fermentation, yeast produces alpha acetolactate during cell growth and later absorbs diacetyl and converts it to less flavor-active compounds, namely 2,3 butanediol and acetoin. For this reduction to take place, active yeast is required late in fermentation.

Removing beer from the yeast too early can leave diacetyl behind. If you are lucky enough to have temperature control, letting the temperature rise about two thirds of the way through fermentation will usually increase yeast metabolic activity enough to absorb most of the diacetyl present in the fermentation. A strong, viable yeast is needed for this. A sluggish fermentation will generally lead to low yeast in suspension and poor diacetyl removal. This is one of the reasons why preparing an adequate yeast starter is so crucial — not only does a fast fermentation limit bacterial growth, it can also limit diacetyl production. Esters are another common beer problem. A few practical means of decreasing the level of esters would be to one, increase the amount of aeration at pitching, two, increase the trub content in the wort and three, pitch a larger volume of yeast.

Another flaw homebrewers should learn to detect is oxidation. This is a chemical reaction that begins during the brewing process and continues throughout the life of the beer. While oxygen is critical at the beginning of fermentation to promote cell growth, it is detrimental at any other stage of the process. At its worst, an oxidized beer will have a papery or grassy aroma and flavor. To limit the extent of oxidation, you should avoid low mash-in temperatures — below 145 °F (63 °C) — sparge and transfer gently and fill bottles or final containers with minimal agitation. Even though you may package with active yeast, the yeast does not absorb all of the oxygen that is picked up during sloppy filling.

Better Beta Advice

"Help Me, Mr. Wizard"

A traumatic tea taste and an over-carbonated stout

I have been wondering about the effects of falling temperatures during mashing. If I have a single infusion mash that starts high at 155 °F (68 °C) (alpha amylase range), and slowly cools back down to 148 °F (64 °C) (back into beta amylase range), do the beta enzymes "reactivate" or do the high temperatures cause them to remain denatured?

Steve Antoch
North Bend, Washington

Denature is one of those words that is often thrown around with little explanation. An enzyme, by definition, is a protein that catalyzes a biochemical reaction. The amylase enzymes catalyze the degradation of starch into smaller molecules.

Enzyme activity is affected by temperature and the rate of a specific reaction increases until the temperature causes the enzyme to denature. In simple terms, the protein or proteins that comprise an active enzyme irreversibly uncoil when they denature. Common examples of denatured protein are found in the refrigerator and kitchen. The cheese making process begins by denaturing milk proteins to form curd. Once milk is converted to curds and whey there is no turning back. Another example of denatured protein is a cooked egg. The solid white material in any cooked egg is denatured egg white. Whether the denatured egg protein is found in meringue, fried, poached or hard-boiled eggs, the native (not denatured) egg white cannot be restored.

Enzymes may be in their native states without being active and environmental factors such as pH, mineral co-factors and substrate concentration do affect enzyme activity. The amylase enzymes active in a mash are most effective around pH 5.2. If the mash pH were increased to say 7 pH by adding a strong base-like sodium hydroxide the activity of the amylase enzymes would dramatically reduce and become inactive. If the pH was then reduced to 5.2 pH by adding a strong acid, the enzymes would again become active. This is because pH affects the electrical charge on the various ionizable groups associated with proteins. These groups include carboxylic acid and amino "functionalities," to use the scientific language. The charge on a functional group is affected by pH and this has a profound affect on enzyme activity, but pH changes do not necessarily cause an enzyme to denature (although radical changes in pH can cause an enzyme to denature).

An enzyme, by definition, is a protein that catalyzes a biochemical reaction.

The practical message is to be careful with your mash. When in doubt it is always safest to start off a bit cooler than desired and to move the temperature up to the target. Enzyme denaturation does not occur instantaneously and if you intend on mashing in at 140 °F (60 °C), for example, and accidentally come in at 162 °F (72 °C) you can quickly add cool water and retain the activity of some beta-amylase molecules that have yet to be "cooked" by the high temperature. Happy mashing!

Hop Island iced tea

Hello and HELP! Every batch of I.P.A. or other highly hopped ale that I have brewed has a distinct iced tea flavor. I have looked and looked but can't seem to find any advice to remedy this. I talked to the staff at my local homebrew shop and they told me that the flavor came from the hops and that I would come to appreciate it. Could it be from dry-hopping? I know that iced tea tends to be high in tannins, so could this be the cause? Could Polyclar help remove the tannin? I have tried to adjust my brewing techniques (lowering the temperature of the steeping and sparge water, increasing boil times, etc.), but still have this flavor. I have brewed an oatmeal stout and a Belgian that came out fine. I am a partial extract brewer using specialty grains.

Tray Thomason
Carlsbad, California

I partially agree with the information your homebrew shop provided and that is that hoppy beers often have a bite from the tannins in the hops. This is similar to the astringency of strong tea and young red wines. However, I strongly disagree with the notion that hoppy beers are all overly astringent and that the true hop connoisseur will come to appreciate the flavor in time. To me that is a defeatist attitude. To tackle the problem a brewer should consider what is happening in the mouth and then work backwards to conquer!

The source of the iced tea flavor in hoppy beers is obviously the hops. Hops contain bittering acids, aromatic oils and plant matter. It is the plant matter that imparts this potentially unpleasant flavor. If the quantity of plant matter added to the beer is reduced, so is the astringency in the finished product. One could conclude that I am suggesting that you avoid brewing hoppy beers - but that's not my point.

The "classic" ideas about hopping are really quite limited when brewing some of the aggressively hopped beer

styles found on the market. The basic notion is that high alpha hops are used early in the boil for bitterness and that any hop used for imparting aroma is a lower alpha variety. The problem with this rule of thumb is that the aromatic oils in hops are produced in the same place (the lupulin gland) that the bittering acids are produced meaning that the concentration of aromatic oils typically decreases somewhat proportionally with alpha acids.

Using high oil hops is one way of adding a good deal of hop oil while minimizing the addition of the hop plant matter. The notion that high alpha hops in general have poor aroma is totally false. Anyone who has ever rummaged around in the hop room of a brewery that uses whole hops has likely smelled many nice high alpha varieties. Historically, the alpha acids had a value that simply could not be "wasted" and any hop varieties with appreciable alpha were used for bittering. In fact, most beer brewed in the world has little hop aroma and the vast quantity of hops grown in the world are produced for alpha acids. In fact, most statistics on hop production equate yields in terms of metric tons of alpha produced because that remains the most important stat to the commercial brewer.

Another way of minimizing the plant material added to the brew is through hop pellet selection. Two types of hop pellets are produced by hop processors: the type 90 and the type 45. A type 90 pellet contains 90% of the weight of unprocessed hops. This means that 100 pounds of raw cone hops yield 90 pounds of pellets. The missing 10 pounds is from stems, strigs and the like. Type 45 pellets are made by separating much of the leafy matter from the lupulin glands that contain the stuff brewers want from hops. 100 pounds of hops yield 45 pounds of type 45 pellets. Using type 45 pellets for aroma will reduce the amount of plant material added to your beer by 50%. Let's go a step further and essentially eliminate plant material from the equation and use a liquid hop preparation - not sexy, but functional. Hop extracts that contain both bittering acids and oils and are available in fractions of

particular compounds. If you want hop aroma without bittering acids and plant material there are hop oil extracts available. There are even hop tablets that are kind of like Alka-Seltzer tablets infused with hop oils that make measuring a no-brainer.

On another note, I personally have never used a fining, such as Polyclar, to remove astringency from beer but the idea has merit. The reason tea drinkers add milk to hot tea is to bind tannins and mellow the tea. Astringency is a sensation and occurs when tannins from food or drink bind with proteins in the mouth. If the tannins are already bound to a protein then they are not available to the palate. Polyclar resembles protein and reacts with tannins in solution. Some winemakers use egg whites to fine their wines and I suppose one could do the same with beer. The bottom line is that you can have in-your-face aroma sans astringency!

Unfinished business

Last December I brewed a 3-gallon (11.4-L) batch of imperial stout, pitching a Scottish Ale yeast starter after cooling. I saved some of the extra wort from sparging, (about a gallon or 4 L), and set it aside in my refrigerator (original gravity was 1.100). I kept some of the original yeast slurry, and about one week after initial fermentation, boiled some of the extra wort for the starter and pitched the second batch of active yeast when transferring from the primary to the secondary - the gravity at this time was 1.060. After two weeks, I transferred the beer to a sanitized fermenter and aerated the beer - the gravity was then down to 1.042. Once again I kept some of the yeast slurry back, boiled and cooled some of my saved wort to re-activate it and pitched yeast and 2 oz. of corn sugar (boiled in 1 cup of water) at bottling. Final gravity at bottling was 1.040. Six weeks after bottling, I wanted to taste the beer to make sure everything was running smoothly, but discovered that my stout was over-carbonated! The flavor was good, no off flavors detected, so I don't think contamination is the culprit. I think that the fresh yeast at bottling fed on residual sugars left unfermented in the beer as well as the priming sugar, resulting in too much carbonation! What I would like to know is if I can "bleed off" some of the carbonation by lightly tipping the cap and re-sealing when the gas escapes? Is there another way to blow off some of the carbonation to even the beer out?

Erin Ferre
Salem, Oregon

Wow! It sounds like you have gotten yourself into a pretty sticky situation, both figuratively and literally. As much as I would like to deliver a silver bullet on how to remedy the situation, my advice runs only so deep before drying up, which is what this beer should have done before you bottled it.

The root of the problem with your beer is that it was bottled too soon. It's hard to predict where a beer will finish

without knowing the mashing schedule used and the types and amounts of special malts, but a brew with an OG of 1.100 (~25 °Plato) should finish fermenting somewhere between 1.020 and 1.030 (5 °Plato-7.5 °Plato).

Sluggish fermentations that take a very long time to finish are common with really high gravity beers. If you cut your fermentation time any shorter than 6 weeks you might be in for a surprise, especially if you're using a Scottish ale strain that is known for being slow and leaving behind some fermentables.

It seems that you took many steps to help push the gravity down by adding yeast several times and even aerating late in fermentation (a practice I personally avoid), but your efforts fell short. If you had the opportunity to take another shot and brew this beer again, I would suggest two things: The first is to begin with a larger than normal yeast pitching rate. The rule of thumb is to use 1 million yeast cells per milliliter of wort per degree Plato. This beer had an original gravity roughly twice that of a normal beer and the pitching rate needs to be roughly doubled according to the rule of thumb. This additional yeast will help your stout finish before it hits the bottle.

The other thing I would do is a forced fermentation to determine the final gravity. Forced fermentations are easy to do — simply take a small sample of wort and add excess yeast to it in order to reach the final gravity before the main batch is done. This way the hydrometer reading has real meaning.

When I brew high gravity beers I feel most comfortable using an aggressive yeast strain that can handle high gravity wort. Although Scottish ales are strong, the 1.100 original gravity in this imperial stout is getting up there for most strains, especially if you fermented the beer cool.

I suppose you could open all the bottles, allow them to de-gas for a while and recap them to help salvage the batch. The potential risk I envision is that if you keep the beer around for a long time period, fermentation may continue and you could have exploding bottles in the future. Good luck with your rescue attempt and be careful when opening the bottles. I would wear safety glasses when uncapping the bottles and would point the top of the bottle away from people (including myself!).

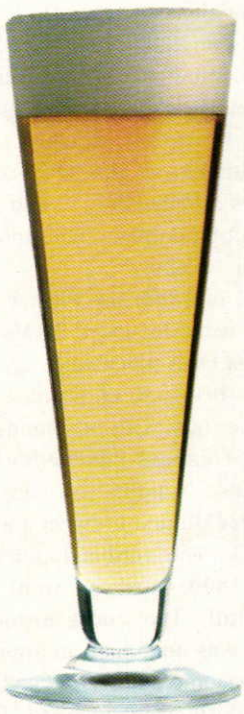
Do you have a question for Mister Wizard? Write to him c/o Brew Your Own, 5053 Main Street, Suite A, Manchester Center, VT 05255 or send your e-mail to wiz@byo.com. If you submit your question by e-mail, please include your full name and hometown. In every issue, the Wizard will select a few questions for publication. Unfortunately, he can't respond to questions personally. Sorry!

Northern German Pils

An edgy blond lager with a bitter history

by Horst D. Dornbusch

In the abstract, it is always difficult to decide when a variation on a beer style becomes a new style in its own right. This clearly applies to the Northern German Pils, or just Pils for short. This brew is perhaps best typified by the Jever Pils brand, which is made in the small town of Jever in Frisia (or Friesland in German), in the northwestern-most part of the country, adjacent to both Holland and Denmark. The Pils evolved as a major beer style shortly after World War Two. It is the northern Germans' answer to the Bohemian Pilsner (first brewed by the Burgher Brewery in Pilsen in 1842) and the southern German Helles (first brewed by the Spaten Brewery in Munich in 1894), and the Dortmund export (which gained popularity in the 1920s). The name Pils, obviously, is an abbreviation of Pilsner.



northern german pils by the numbers

OG	1.044–1050 (11–12.5 °P)
FG	1.008–1.012 (2–2.5 °P)
SRM	2–5
IBU	25–45
ABV	4.4–5.2

A Pils is mostly characterized by its straw-blond appearance — a beer simply could not get much paler without the use of adjuncts, which are forbidden by the German Beer Purity Law — and its enormous noble-hop kick. In fact, in a Pils, the hoppiness should almost tingle up-front. It is well-attenuated and has a very dry, crisp and refreshing finish. With its spritzy effervescence and next to no fruitiness, esters or diacetyl, it tastes light, refreshing and delicate. It is served in slender, conical glasses that allow the hop bouquet to emanate from the brew's sturdy, long-lasting head.

I believe the Pils is a legitimate style the same way the other blond German lagers, the Helles and the Dortmunder, are styles. Though these three beers are all built on the original hop-aromatic Bohemian Pilsner, they each take different directions. While the Helles, like the Pils, accentuates sparklingly brilliant paleness and German-style noble hoppiness, only the Pils excels in "un-Bavarian" edgy hoppiness — perhaps analogous to the transformation of the British pale ale into an IPA. The Dortmunder, by contrast, has more alcoholic strength than the Pilsner, the Pils and the Helles, but it remains closer in color to the Pilsner. In hoppiness, the Dortmunder found a middle ground among the other three — more pronounced than that of a Helles, less aromatic than that of a Pilsner and less assertive than that of a Pils. With these subtle delineations, the three German blond lagers together represent an important step in the transition of the original Czech Pilsner into a global quaffing brew.

Today, Warsteiner of Westphalia is both the bestselling Pils and the bestselling beer brand in Germany. Other top German Pils brands, many of which are now available in much of North

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RECIPE

Edgy Pils

(5 gallons/19 L, all-grain)

OG = 1.047 FG = 1.010
IBU = 48 SRM = 3 ABV = 4.8%

Ingredients

9.5 lbs. (4.3 kg) Weyermann Pilsner Malt (2 °L)
10.4 AAU Tettnanger hops (75 mins) (2.3 oz./65 g of 4.5% alpha acid)
4.5 AAU Tettnanger hops (15 mins) (1 oz./28 g of 4.5% alpha acids)
1 oz. (28 g) Hallertauer Mittelfrüh hops (aroma)
1 tsp Irish moss (15 mins)
Wyeast 2042 (Danish Lager) yeast (~3 qt./3 L starter)
1 cup dried malt extract (for priming)

Step by Step

Dough in at about 122 °F (50 °C) for a 30-minute rest. Then raise the mash temperature, using a combination of hot-water infusion and direct heat, to 148 °F ±2 °F (64 °C ±1°C) for a 30-minute beta saccharification rest. Then raise it to 156 °F ±2 °F (69 °C ±1 °C) for a 30-minute alpha saccharification rest. Then raise it to 170 °F ±2 °F (77 °C ±1 °C) for the mash-out. Recirculate the wort until it runs brilliantly clear (about 15 minutes). Then lauter and sparge.

Boil for 90 minutes. Add bittering hops 15 minutes into the

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recipes continued

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boil. Add flavor hops and Irish moss 75 minutes into the boil. Add aroma hops at shut-down. Check the gravity and adjust for evaporation losses. Let rest for about 30 minutes to allow the trub to settle.

Siphon the wort off the trub and heat exchange to a pitching temperature as close to 49 °F (9.4 °C) as possible. If you have trouble heat-exchanging to such a low temperature, pitch your yeast anyway, but refrigerate your fermenter immediately to pull the temperature down to the required level as quickly as possible.

Failure to reduce the fermentation temperature could result in excess diacetyl. Because the lag time between pitching and the start of primary fermentation may be a day or two, it is particularly important to aerate the wort thoroughly to avoid the formation of DMS. Let the brew ferment for about two weeks, at which point it should be at least 90% attenuated (at approximately SG 1.014 or 3.5 °P).

Rack and reduce the temperature gradually by about 2 °F (1 °C) per day. Drop the temperature to as low as your setup allows. The best lagering temperature is around the freezing point, but any temperature below 40 °F (4 °C) is serviceable.

Let the brew mature for about two weeks. Rack again and let it warm up to room temperature for a 3-day diacetyl rest. Then return the brew to the lagering temperature for two to six weeks of final maturation on the yeast, the longer the better. During lagering, the remaining yeast reabsorbs many of its own fermentation byproducts for a crisp taste. It also scrubs the brew clean of dissolved oxygen for greater stability.

At the end of the lagering period, rack the brew once more and prime it for bottling or kegging. Store it at the serving temperature of 46–48 °F (8–9 °C). Allow about two weeks for the priming agent to be metabolized. If you use a Cornelius keg and a CO_2 dispenser, omit the priming agent and set the pressure to about 15 PSI (1 atmosphere). It will take about 2 days for the Pils to be properly carbonated.

Edgy Pils

(5 gallons/19 L, extract only)

OG = 1.047 FG = 1.010

IBU = 48 SRM = 3 ABV = 4.8%

Ingredients

7.1 lbs. (3.2 kg) Weyermann Pilsner liquid malt extract

10.4 AAU Tettnanger hops (75 mins) (2.3 oz./65 g of 4.5% alpha acid)

4.5 AAU Tettnanger hops (15 mins) (1.0 oz./28 g of 4.5% alpha acid)

1 oz. (28 g) Hallertauer Mittelfrüh hops (aroma)

1 tsp Irish moss

Wyeast 2042 (Danish Lager) yeast (~3 qt./3 L starter)

1 cup dried malt extract (for priming)

Step by Step

If performing a full-wort boil, mix the malt extract with your hot brewing liquor in the kettle. If brewing a stovetop beer, add about half of your liquid malt extract to your brewpot. Bring the wort to a boil and begin the 90 minute boil. Add hops at time indicated in the recipe. If brewing a stovetop beer, turn off heat and add remaining liquid malt extract with 15 minutes left in the boil. (Keep the timer going on the boil while you do this.) Follow all-grain instructions to complete.

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America, include Bitburger (the second best selling Pils in Germany) and König Pilsener, both from the Rhineland, as well as Radeberger from Saxony and Holsten Pils from Hamburg. Even the Bavarians have jumped on the Pils bandwagon. Prominent among the Pils brewed in the birth land of the Helles, are the Kulmbacher Mönchshof Pils from Franconia and the Spaten and Paulaner Pils from Munich.

Pilsner, Pilsener, Pils: The Evolution of Semantics

As Pilsner Urquell from the Burgher Brewery of Pilsen was taking the European continent by storm in the mid-1800s, it soon threatened even the unflappable indigenous German brew industry. Interested in defending its growing market and what it considered its proprietary style and brand, the Burgher Brewery registered "Pilsner Bier" as a trademark, in 1859. The move, however, proved little deterrence to imitators. In 1872, the Aktien-brauerei Zum Bierkeller — now known as the Radeberger brewery — was the first to issue a Pilsener-style beer in Germany. Mindful of the age-old motto, if you can't lick them, join them, other German breweries quickly followed suit, including, in the 1890s, several breweries in Munich . . . and they all did the unthinkable: They, too, called their beer "Pilsner."

Thus, in 1898, the Pilsner Urquell brewery went to court in Munich. It filed a test case specifically against the Thomass Brewery of Munich, which had come out with a blonde lager, named "Thomass-Pilsner-Bier." The Bohemians sought an injunction against the Munich brewery's use of its trademark. The verdict handed down in April 1899, however, went against the plaintiff. The court argued that "Pilsner" was no longer an appellation, but had become a universal style designation. With reference to German grammar the court also held that the adjective "Pilsner" — without the middle "e" — refers to anything made on location in Pilsen, whereas the adjective "Pilsener" — with the middle "e" — denotes anything that is similar to a thing from Pilsen but not made there.

The Germans thus resolved the conflict between their own blond, Pilsner-style lagers and those of their Czech competitors not only brew-technically, but orthographically as well, at least in theory. In practice, breweries in Germany have always used — and still do — the designations Pils, Pilsner and Pilsener interchangeably.

The conflict over naming the German blond lagers might not have arisen had Bohemia not belonged to the German-speaking Austro-Hungarian Empire (where it remained until the end of World War One). When the Bavarian brewer Joseph Groll mashed in the world's first pale lager in Pilsen in 1842, the Czech name for the brew was Plzenky Prasdroj, which means "Pilsen's original source." The Czech language is strong on vowel but short on consonants, so Plzen is the Czech spelling of Pilsen — not a likely name for being co-opted by other languages. Because of the political predominance of the German language in Bohemia at the time, however, the German name of the brew stuck. Ur is a prefix meaning "original" in German and quell means "source."

Pils Profile and Ingredients

Germany has a great natural variation in brewing waters ranging from very soft and acidic in the southeast, near the Czech border, to very hard and alkaline in the northwest, near the Dutch border. While water hardness accentuates the perception of hop bitterness, water softness ameliorates it. For this reason, aggressively hopped beers brewed with soft water may actually taste less bitter than lower-IBU beers brewed with hard water. Typical examples are the lagers from Dortmund and the ales from Burton-on-Trent, both made with some of the hardest brewing water in the world. They have a noticeable hop character yet contain average amounts of hops.

Jever, though located in the northwest of Germany just slightly north of Dortmund, happens to be an unusual enclave of exceptionally soft water. Thus, like the original Pilsner, Jever Pils can be empowered with loads of hops without being overdone. These days, Jever has about 44 IBUs, but there are persistent rumors that, in times gone by, Jever had as many as 47 IBUs and that it has reduced its bittering level slightly in modern times to appeal to a wider market. In the American craft brew scene, highly hopped interpretations of a beer style, those made primarily for real hopheads, are often designated as "imperial" (as in Imperial IPA). Within the Pils context, therefore, Jever could be clearly labeled an "imperial" Pils. Unlike a heavily "Cascaded" American IPA or a heavily "Saazed" Bohemian Pilsner, however, a Pils should not have too many aromatic reverberations. The aftertaste should be hop-zesty rather than hop-aromatic. Because edgy hoppiness is the dominant and most distinguishing characteristic of a Pils — as opposed to a Bavarian, Dortmunder or Bohemian lager — our Edgy Pils recipe on page 19, is based on the Jever.

Breweries in other regions of Germany make very hoppy Pils versions, too, mostly brewed with harder water than Jever's and thus made with fewer IBUs, but most have at least 35 IBUs. Examples are the two Rhenish Pils versions, Warsteiner and Bitburger, each with about 37 IBUs. Following a global trend, however, there are also many industrial, "dumbed-down" Pils version on the market in Germany today, with bittering levels as low as 25 IBU.

One of the most suitable hops in a true Pils is the noble Tettnanger for both bittering and flavor, added at the beginning and near the end of the boil. At its best, Tettnanger gives the brew a spicy, ground-pepper component and imparts a slight grassiness as well, which is desirable as long as the hops are fresh, not cheesy-old. For aroma, Hallertauer Mittelfrüh or a similar variety is an excellent choice. Northern Brewer works well as an aroma hops as does the Pacific Northwest Hallertauer triploid Mt. Hood. Some breweries, notably Bitburger, also use Hersbrucker and Perle.

Unlike the Czech orginal and the Munich Helles, a Pils should have a less pronounced malt character. Only the finest and palest 2-row Pils malt,

preferably made from German rather than Czech barley strains should be used. Not surprisingly the signature Jever Pils stems from a grain bill of nothing but Weyermann Pilsner malt, which happens to be readily available in the United States both as grist and liquid malt extract.

With respect to gravities and alcoholic strength, a Pils is fairly "normal" — no surprises. For our recipe, I have picked an OG of 1.047 (11.8 °P). This brew should finish at an FG of around 1.010 (2.5 °P), for an alcohol content of roughly 4.8%. Because the Pils has a distinct crisp finish, the yeast strains bred for Czech or Bavarian lagers tend to be unsuitable. Especially the typical Bohemian lager yeast leaves the brew with a buttery (diacetyl) note and some residual sweetness, both of which run counter to the racy character of the Pils. I always use the clean-fermenting Wyeast 2042 Danish for my Pils. It is the best choice in my view.

From these elaborations, the ideal ingredients list that emerges for our Pils is very clear and almost primitive: Weyermann Pilsner malt, Tettnanger hops, Halletauer Mittelfrüh hops and Wyeast Danish yeast. Because this brew contains no specialty malts, there is no extract and grain recipe.

As for processes, traditionally of course, all Pilsner-type brews were triple-decocted, a necessity for a time when the brewer had to work with under-modified malts. Under-modied malt might contribute to the relatively low, "un-Pils-like" attenuation in many Bohemians lagers. The Pilsner Urquell, for instance, starts out with an OG of about 1.048 (12 °P), which is in the Pils range, but finishes at a high 1.015 (3.8 °P), for an ABV of only 4.4%. Triple decoction of such malt is also largely responsible for the deep golden color of the Pilsner from Pilsen and many brewers hold that it produces a maltier brew. Other brewers, however, believe that a multi-step infusion mash of well modified malt is perfectly adequate for all traditionally decocted brews (as long as they do not contain adjuncts) and that this is more valid for a Pils, which is straw-blond rather than golden-blond and relies less on maltiness than hoppiness for its signature flavor. Tastes are obviously subjective and we live in a free country, so decoct your Pils if you want to!

One step, though, ought not to change from the traditional Pils-brewing regimen: In the old days, all Pilsner-style brews were lagered for about three months. Lagering is still a requirement today to bring out the brew's mellowness and drinkability. Three months is still a desirable target, but if you do not have the patience to do so, consider 35 to 40 days of lagering your minimum. It's worth the wait! When you are ready to pour your Pils, serve it at about 46 °F to 48 °F (8 °C to 9 °C).

Horst Dornbusch writes "Style Profile" in every issue of BYO.

making GREAT WINE FROM KITS

Everyone knows that good grapes make world-class wine. But in recent years, the quality of kit wines has improved enough to impress even the most dedicated fresh-fruit purist. As a homebrewer, you can also try your hand at winemaking with this new generation of kits. You already have the majority of the equipment, such as fermenting buckets and carboys. Plus, you have a solid grasp on the basic skills needed for wine kits, such as sanitation, siphoning and using a hydrometer. Making wine from kits as a homebrewer is easy. You'll be impressed with the final quality of your first batches.

The spectrum of wine kit choices available guarantees that there is a variety to suit almost any taste. From hardy reds to delicate whites, well over 2,000 different styles of kits are now being sold in North America. These kits give the homebrewer a chance to easily make wine any time of the year with juices and concentrates sourced from vineyards in California, Australia, France, Italy and other classic wine areas. Plus, you'll end up saving quite a bit of money over commercial bottles of wine of comparable quality. Another bonus: Many kits are all-inclusive. They contain all the additives you need, pre-measured. The recipes are easy to follow and the results are fairly predictable.

There are four main types of wine kits: sterile juice; fully concentrated grape juice; partially concentrated grape juice; and kits that combine juice and concentrate. Many wine kits also give you a clear idea of the length of time before the kits will ready to bottle, such as four-week kits or six-week kits.

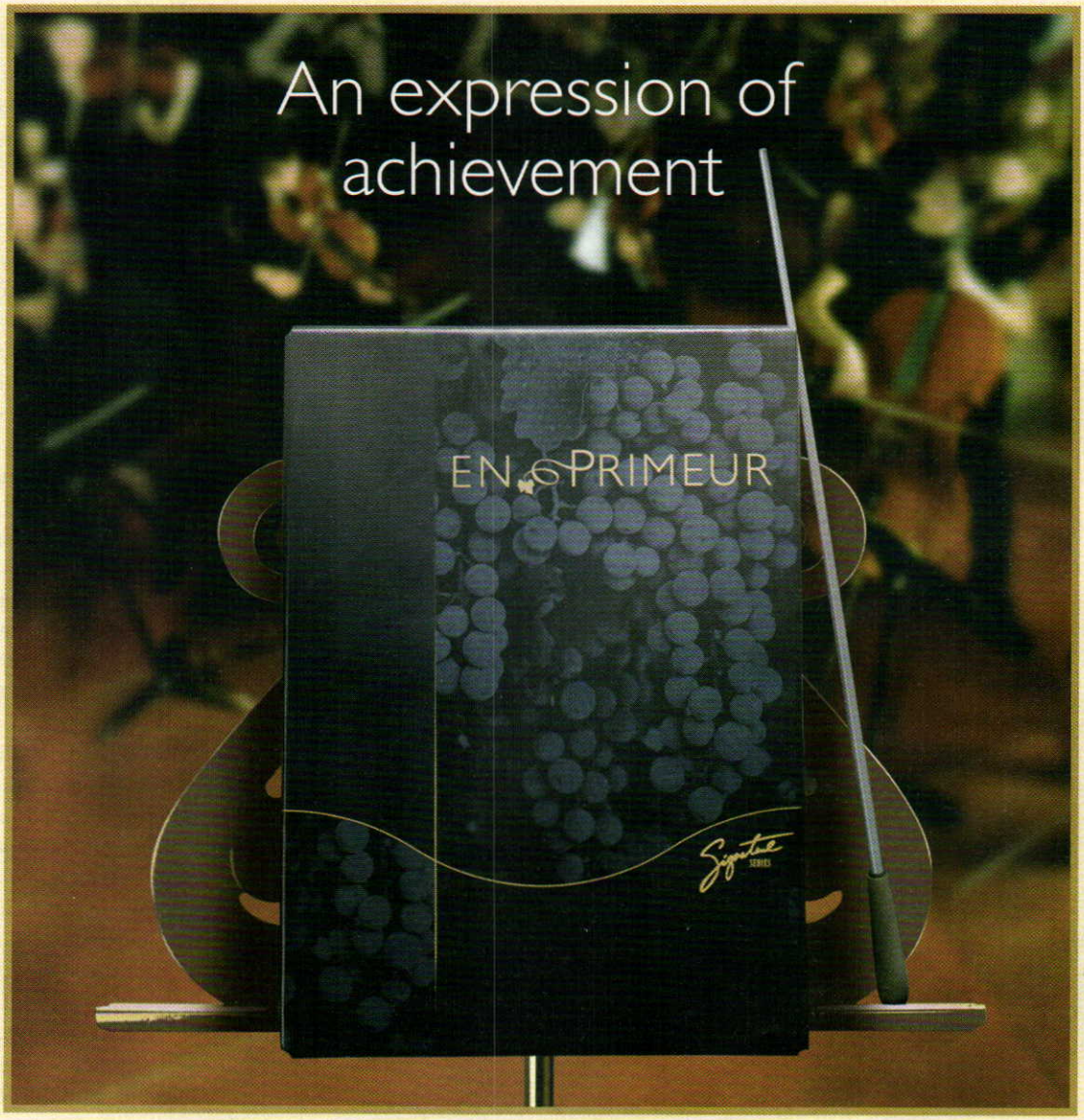
The approach to making wine from these kits is similar. The only difference is that the all-juice kits require no additional water. These kits tend to be the most expensive due to juice's comparative purity and costly transport (it weighs more than concentrate). Grape concentrates are simply grape juices that have had water removed through a high-tech process. Some kits are fully concentrated; you have to add water, and sometimes sugar, before making the wine. Juice-concentrate blends require less water and produce a wine that's truer to character.

Kit prices should directly correlate to the purity of the product. Higher-percentage juice kits and those with a higher percentage of a specific wine grape will tend to be more expensive.

Since you are a homebrewer, you already have most of the equipment you'll need. You'll use a primary fermenter, a long-handled stainless steel or food-grade plastic spoon, a glass carboy with airlock, siphon tubing and a hydrometer. A typical wine kit will contain one bladder pack of juice and-or concentrate, a yeast packet and several numbered, pre-measured and pre-mixed additive packets.

Open the can, pail or bladder pack in your kit. Taste the contents — they should be clean, sweet and fruity. Pour the contents into a primary fermenter and add the first group of ingredients (water, any wine acids, grape tannins and nutrients, and sometimes oak chips, depending on the wine style). The recipe will be very specific. Once you have mixed the concentrate and the first group of ingredients, stir them well with your sanitized spoon.

You may now want to take a specific gravity reading, even though the recipe will usually provide it. It's just nice to know that you're on track, especially this early. Sprinkle the yeast package on the surface and stir it in. Try to keep fermentation temperatures in the range recommended in the



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recipe. Usually, red wines ferment between 70° F and 80° F. Whites should begin between 72° F and 75° F and then be brought down to 68° F to finish fermenting. If you keep your batch at the right temperature, the yeast will start working fairly quickly and provide a vigorous fermentation.

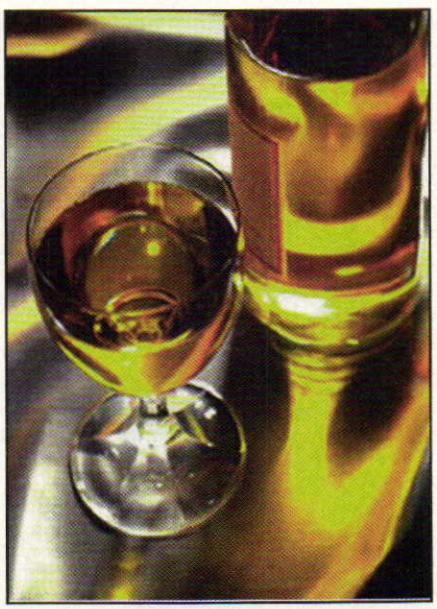
After the main activity of fermentation dies down, you are ready to rack (or siphon) the wine. Most kits will give a recommended specific gravity target for your first and subsequent rackings. The main purpose is to draw the wine off the sediment into a fresh, sanitized carboy. The last two rackings will also usually introduce sulfite powder to fight any oxidation brought on by your wine's contact with air.

Fining agents may also be added in pre-measured ingredient packages during rackings to help clarify the wine. The final gravity target reading will be listed in your kit instructions. Keep in mind that many wine styles will result in final gravity readings well below that of your homebrew. For instance, many dry wines come in below zero!

Bottling is very easy and is similar to bottling your beer, with the exception of using corks instead of caps as closures. Just as with homebrew, a bottling wand makes life easier. There is a broad selection of bottle styles and sizes to match the wine of your choice. For a five-gallon batch, you will need the equivalent of 26 standard 26-ounce (750 ml) bottles. You'll sanitize your bottles and bottling tubes. After you fill the bottles, cork them. Confer with your retailer regarding the need to "prep" your corks (some corks require a cursory soaking in hot water to make them easier to place in the bottle). Hand-held corkers can range in price from $8 to $20, depending on the features. (Remember, these corkers can also be put to good use for bottle-conditioned Belgian-style homebrews!)

There will be aging instructions in your kit recipe. Although as a rule, even the most basic kit will improve with at least three months aging in the bottle and juice-concentrate kits benefit from even longer aging times.

As a homebrewer, you already have the skills and the equipment. Now all you need to do is try out a wine kit for yourself!



10th annual label CONTEST

This year marks the tenth anniversary of *Brew Your Own* magazine and with that comes the 10th annual *BYO* Label Contest. It is never easy as we sit down each year to eyeball hundreds of custom labels from our creative readership, but when all is said and done, we know our time was well spent. Great satisfaction is gained when we crown our Grand Champion, finalize our votes for Gold, Silver and Bronze labels, give mention to the honorables and select our Editors' Picks on a strict "hey this label is talking to me" basis. It's not an exact science, but in 10 years of professional label critique, we'd like to think of it as an art. So . . . without further ado, grab a cool homebrew and check out your cool labels. Cheers!

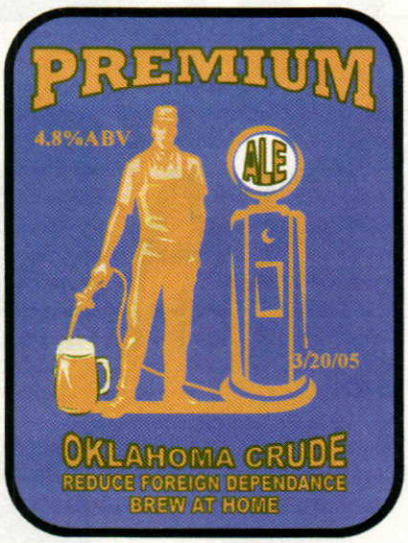
grand champion

winners

Todd Enlund
Gresham, OR
Prizes: Automasher all-grain mash temperature control unit from **Autolich, LLC;** Gift certificate from **Homebrewers Outpost & Mail Order Co.**; Pitcher & set of 4 glasses from **Homebrewers Pride**; Yeast coupons from **White Labs, Inc.**; Party Pig set-up package from **Quoin Industrial**

GOLD

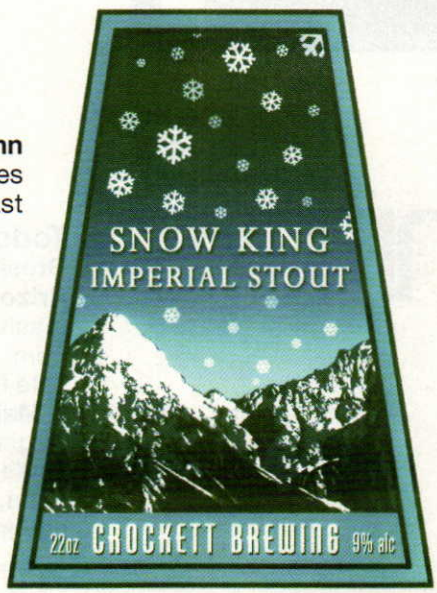
Chris Gillis
Sommerville, MA
Prizes: Homebrew cleaning & sanitizing kit with pH stabilizer from **Five Star Chemical Company**; Talking beer opener from **NFG Homebrew Supplies**; Set of 4 glasses from **Homebrewers Pride**; Yeast coupons from **White Labs, Inc.**



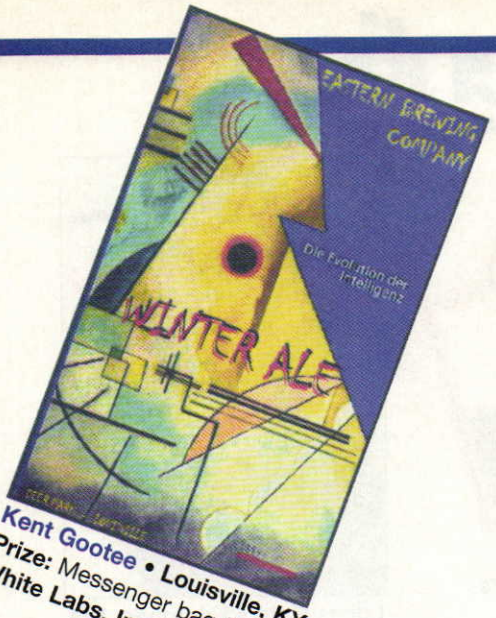
David Mansfield
Broken Arrow, OK
Prizes: Counter-pressure bottle filler & tubing kit from **Foxx Equipment Company**; Talking beer opener from **NFG Homebrew Supplies**; Set of 4 glasses from **Homebrewers Pride**; Yeast coupons from **White Labs, Inc.**

SILVER

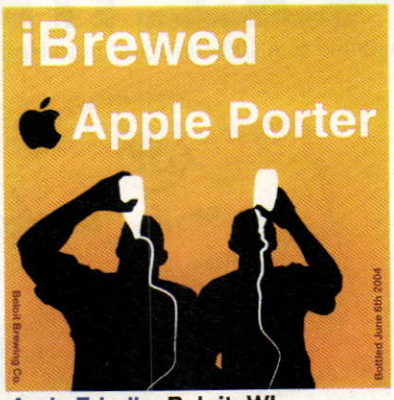
Ian Crockett
Daly City, CA
Prizes: ThruMometer from **Blichmann Engineering, LLC**; Set of 4 glasses from **Homebrewers Pride**; Yeast coupons from **White Labs, Inc.**



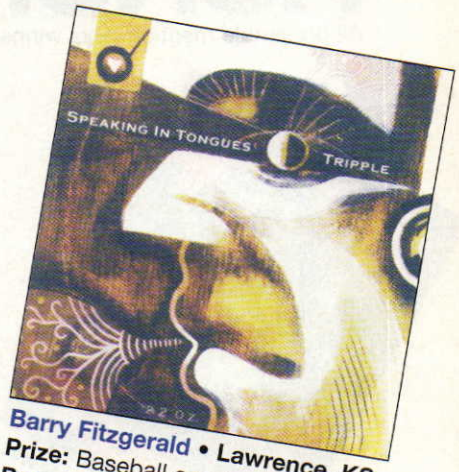
BRONZE



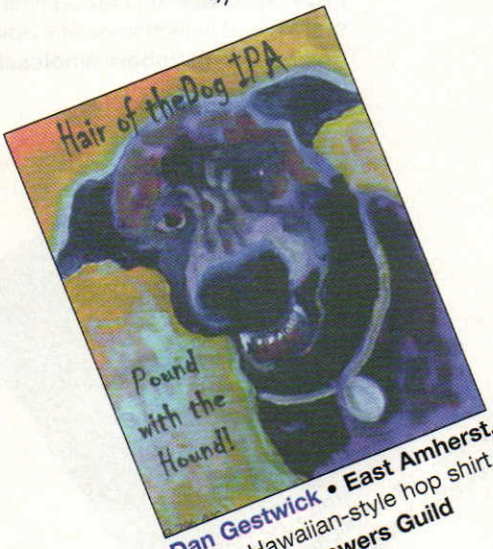
Kent Gootee • **Louisville, KY**
Prize: Messenger bag from **White Labs, Inc.**



Andy Friedl • **Beloit, WI**
Prize: Selection of 4 micro brewery glasses from **BeerCollections.com**

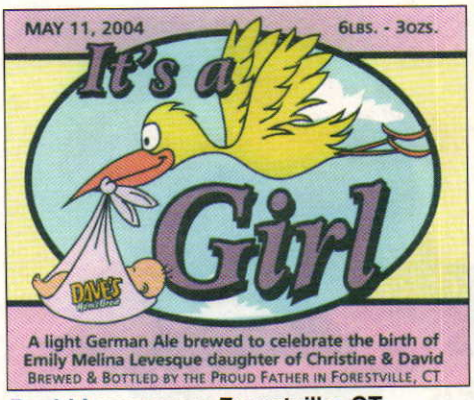


Barry Fitzgerald • **Lawrence, KS**
Prize: Baseball cap from the **American Brewers Guild**

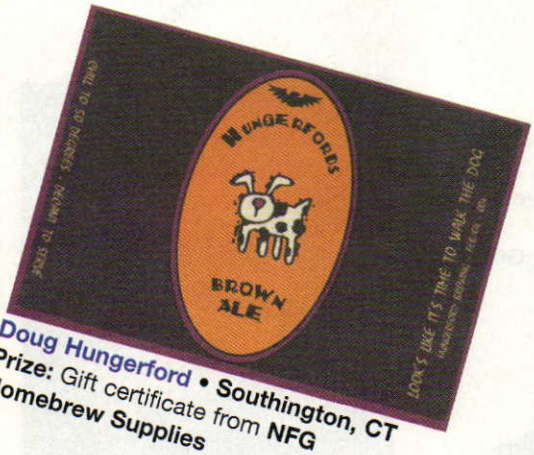


Dan Gestwick • **East Amherst, NY**
Prize: Hawaiian-style hop shirt from the **American Brewers Guild**

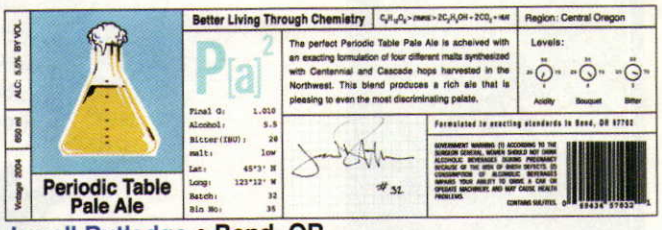
C.J. Hall • **Madison, WI**
Prize: Brew pot/fermenter thermometer from **BrewCitySupplies.com**



David Levesque • **Forestville, CT**
Prize: BrewMometer from **Blichmann Engineering, LLC**



Doug Hungerford • **Southington, CT**
Prize: Gift certificate from **NFG Homebrew Supplies**



Jewell Rutledge • **Bend, OR**
Prize: Fleece jacket from **Muntons p.l.c.**

HONORABLE mention

All honorable mention label winners are entitled to a 10% discount from **Homebrewers Pride**

HONORABLE mention

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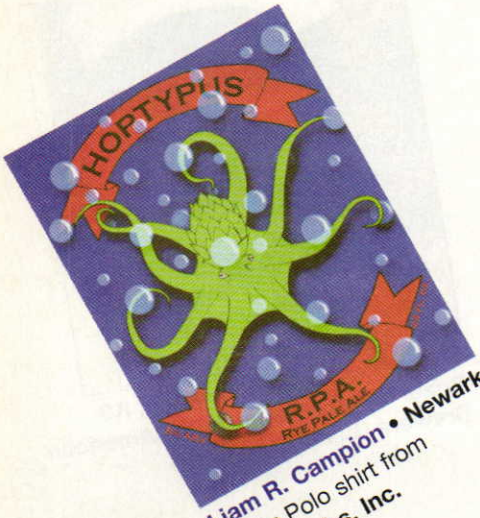
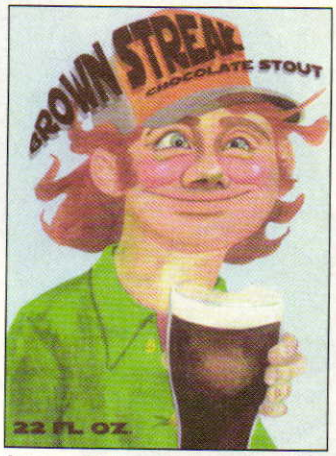
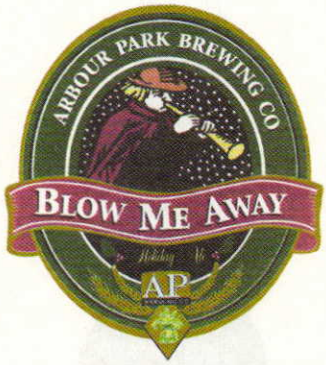


Liam R. Campion • Newark, DE
Prize: Polo shirt from **White Labs, Inc.**

Kitt Ormsby • Scottsdale, AZ
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**



Lucas Rate • Edmonds, WA
Prize: Alcobase kit, carbon filter system and selection of Still Spirits flavors from **Steinbart Wholesale**

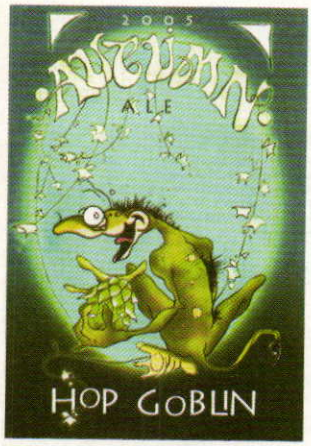


Michele Nagle • Newark, DE
Prize: Gift certificate from the **Wine & Beer Emporium**

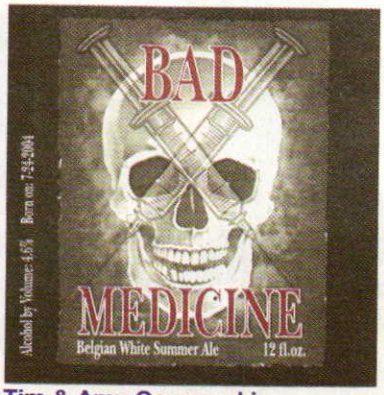
Russ Shroader • Cedarhills, UT
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**

Melissa Williams • Chesapeake, VA
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**

Stephan Brezinsky & Jen Zakrzewski
New York, NY
Prize: Gift certificate from **High Gravity**



Terry Moran • Vancouver, WA
Prize: 2 lbs. of hops from list at www.justhops.com from **My Home Brew Shop**



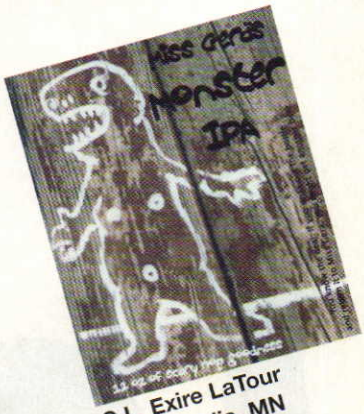
Tim & Amy Gawronski
Grand Rapids, MI
Prize: BrewMometer from **Blichmann Engineering, LLC**

Joe Myers • Brown Deer, WI
Prize: Equipment starter kit and gift certificate for a recipe kit from **Homebrewersupply.com**

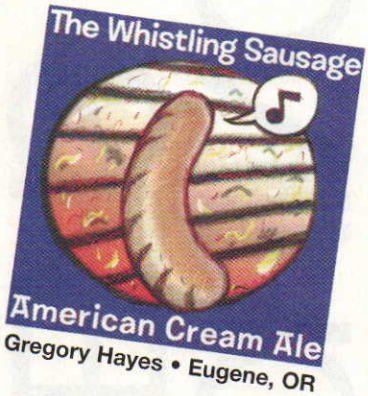
EDITORS' choice

Drew J. Brooks • New Berlin, WI

Darrin J. Burchell • Parris, KY

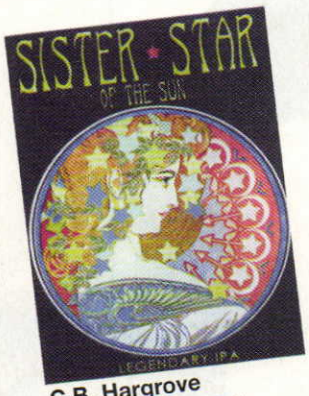


G.L. Exire LaTour
Minneapolis, MN



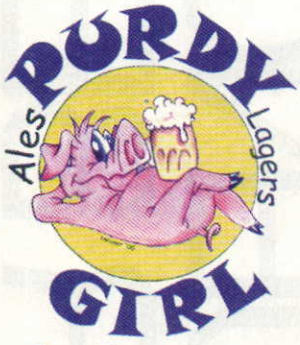
Gregory Hayes • Eugene, OR

Adam Draeger • Pella, IA



C.B. Hargrove
Lawrenceville, GA

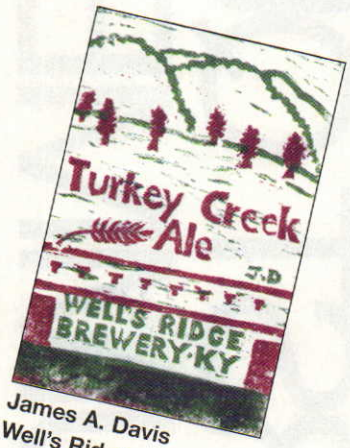
Henry Collingridge
Wellington, New Zealand



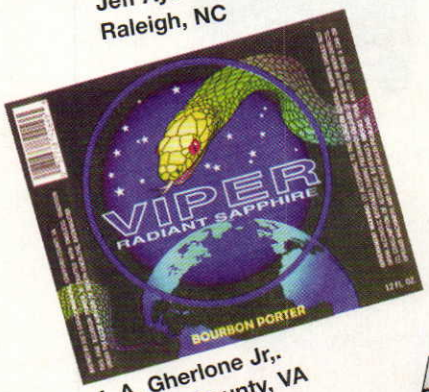
Gerry Houser
Glendora, CA

Jeff Ayers
Raleigh, NC

Glenn Wilson • Williamsville, NY



James A. Davis
Well's Ridge, KY

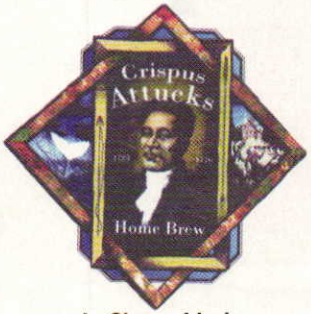


J. A. Gherlone Jr,.
Stafford County, VA

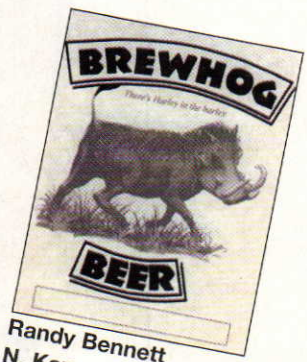
Tom Bielli • Gloversville, NY

Jamie Berg • Bettendorf, IA

Jerry Platsis
Rogers, AR



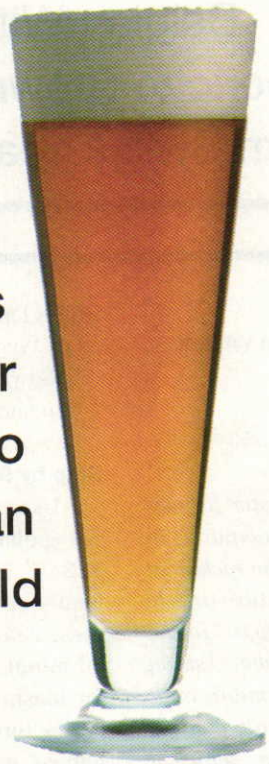
LeShane Lindsey
Brookline, NY



Randy Bennett
N. Kansas City, MO

10 THIRST QUENCHING SUMMER BEERS

Summer's here and it's time to brew some thirst-quenching beers. In our continuing series of stories celebrating our 10th anniversary year, we present 10 beer recipes from *BYO* editors, authors and contributors. These beers are light to moderate-bodied beers that are well-balanced for summer drinking — beers to have if you're having more than one (to paraphrase the old Schaefer ads).



from BYO EDITORS and AUTHORS

Chris Colby's
Wiener Blut (Vienna Lager)
(5 gallons/19 L, all-grain)
OG = 1.052 FG = 1.013
IBU = 25 SRM = 11 ABV = 5.0%

Chris Colby is the editor of BYO *and author of the Techniques column. His most recent feature articles include "Steeping," in the May-June 2005 issue and "Wheat: The Oldest Grain" in the March-April 2005 issue. Chris says, "Wiener Blut is a malty, lightly sweet amber lager with slightly more German noble hops than usual." Silver medal winner at the 2004 National Homebrew Contest.*

Ingredients
5.5 lbs. (2.5 kg) Briess Less Modified Pilsner malt
4.75 lbs. (2.2 kg) Weyermann Vienna malt
6.6 oz. (0.19 kg) crystal malt (20 °L)
4.0 oz. (0.11 kg) crystal malt (60 °L)
6.75 AAU Hallertau Hersbrücker hops (60 mins)
(2.05 oz./58 g of 3.3% alpha acids)
1 tsp Irish moss
¼ tsp yeast nutrients
White Labs WLP920 (Old Bavarian Lager) yeast
1 cup corn sugar (for priming)

Step by Step

In your kettle, mash in at 131 °F (55 °C) with 3.4 gallons (13 L) of water. Pull a 1.0-gallon (3.8-L) decoction, add a pinch of calcium ($CaCl_2$), and begin heating it — stirring nearly constantly. Rest decoction at 158 °F (70 °C) for 5 minutes, then boil for 15 minutes. Add decoction to main mash and adjust temperature to 154 °F (68 °C) and hold for 45 minutes. Heat to 168 °F (76 °C) for mash out. Transfer mash to lauter tun. Sparge with 180 °F (82 °C) water until grain bed reaches 170 °F (77 °C), then continue sparging with 170 °F (77 °C) water. Boil for 90 minutes. Add ¼ tsp gypsum with 75 minutes left in boil. Add the hops at 60 minutes. Add Irish moss and yeast nutrients with 15 minutes left. Chill wort and transfer to fermenter. Aerate with a 45 second shot of oxygen (swirl carboy as you oxygenate). Ferment at 54 °F (12 °C) and lager for 6 weeks at 40 °C (4.4 °C).

Wiener Blut (Vienna Lager)
Mueller Wheat (American Wheat)
Belgian Wit
American Brown Ale
Cream Swill (Cream Ale)

Ashton Lewis's
Mueller Wheat (American Wheat)
(5 gallons/19 L, all-grain)
OG = 1.045 FG = 1.007
IBU = 18 SRM = 5 ABV = 4.9%

Ashton Lewis is the Master Brewer at Springfield Brewing Company in Springfield, Missouri and the technical editor of BYO. His latest feature article was "The Dark Secrets of Stout," in the January-February 2005 issue. Ashton says, "We settled on Weyermann malt about 5 years ago. This malt gives a more consistent cloudiness, which I feel is important for the style. Our wheat is dry, crisp and refreshing — and has a certain 'snap' from the malted and raw wheats used, as well as a spicy hop nose from the Liberty hops. The foam has a rich, creamy and rocky appearance. Our wheat beer has been our number one seller since we opened in December 1997 and won a gold in the American-style wheat beer category at the Great American Beer Festival (GABF) in 2003 and a bronze in the same category in 2004."

Ingredients
3.7 lbs. (1.7 kg) Weyermann pale wheat malt
0.69 lbs. (0.31 kg) raw (unmalted) wheat
4.8 lbs. (2.2 kg) pale 2-row malt (Cargill Ida-Pils)
3.20 AAU Perle hops (70 mins) (0.40 oz./11 g of 8% alpha acids)
2.20 AAU Liberty hops (30 mins) (0.40 oz./11 g of 5.5% alpha)
0.56 oz. (16 g) Liberty hops (0 mins)
White Labs WLP001 (California Ale) or Wyeast 1056 (American Ale) yeast
1 cup corn sugar (for bottling)

Step by Step

Use a mash water volume of 2.9 gallons (10.9 L) and mash in at 122 °F (50 °C), rest for 20 minutes, heat to 140 °F (60 °C), rest for 30 minutes, heat to 154 °F (68 °C), rest for 30 minutes and heat to 169 °F (76 °C) for mash-off. Transfer the mash to the lauter tun and do a 20-minute vorlauf before sending wort to the kettle. When the top of the grain bed is covered by ~1 inch (~2.5 cm) of wort, begin sparging with 169 °F (76 °C) sparge water. Measure wort gravity towards the end of collection and do not collect wort weaker than 2 °Plato (SG 1.008). Boil wort for 90 minutes. Cool the wort to 64 °F (18 °C) and aerate. Ferment at 64 °F (18 °C). Fermentation is typically down to ~2.8 °Plato (~SG 1.011) in 3 days. Hold temperature at 64 °F (18 °C) for 4 days or until the gravity is no greater than 2.2 °Plato (SG 1.009). Cool beer to 50 °F (10 °C) and hold for 6 days or until the gravity is no greater than 1.9 °Plato (1.008) and then chill to 32 °F (0 °C). Bottle with corn sugar or keg and carbonate to a level of 2.8 volumes of carbon dioxide.

Steve Bader's
Belgian Wit
(5 gallons/19 L, extract with grains)
OG = 1.049 FG = 1.012
IBU = 20 SRM = 5 ABV = 4.7%

Steve Bader is the owner of Bader Beer and Wine Supply in Vancouver, Washington and is BYO's *Replicator. Steve says, "This beer is a favorite hot weather beer due to its lighter body and refreshing taste from the coriander and bitter orange peel. Hop bittering levels are subdued to let the coriander and bitter orange peel come through in the bitterness."*

"The wit is slightly cloudy, with a very light color since there are no grains with any color used to make this beer. The wit yeasts help to give the refreshing flavor with a bit of "spicy" phenolic and tart flavors. The wit yeasts also can handle slightly warmer fermentation temperatures to 74 °F (23 °C), making this a good beer to brew in the late spring or early summer."

Ingredients
6.6 lbs. (3.0 kg) Coopers Wheat liquid malt extract (unhopped)
0.5 lb. (0.23 kg) Belgian wheat malt
0.5 lb. (0.23 kg) Belgian Pilsner malt
5.4 AAU Hallertau hops (60 min) (1.5 oz./42 g of 3.6% alpha acids)
0.5 oz. (14 g) coriander seed (crushed)
1 oz. (28 g) bitter orange peel
White Labs WLP400 (Belgian Wit Ale) or Wyeast 3944 (Witbier) yeast
0.75 cup corn sugar (for priming)

Step by Step

Steep the crushed malts in 3 gallons (13.5 L) of water at 152 °F (67 °C) for 30 minutes. Remove grains from wort, add the malt syrup and bring to a boil. Add the bittering hops and boil for 60 minutes. Add the spices for the last 15 minutes of the boil. Cool the wort to 75 °F (24 °C), transfer to fermenter, top off to 5 gallons (19 L) aerate the beer and pitch your yeast. Ferment at 70–74 °F (21–23 °C) until fermention ends, then bottle and enjoy!

All-grain option:

Replace the 6.6 lbs. (3.0 kg) of malt syrup and both grains with 5.5 lbs. (2.5 kg) of Pilsner malt, and 5.5 lbs. (2.5 kg) of wheat malt. Mash at 152 °F (67 °C) for 60 minutes. Collect approximately 7.0 gallons (32 L) wort to boil for 90 minutes and have a 5 gallon (19 L) yield. Lower the amount of the

hops to 1.25 oz. (35 g) ounce to account for higher hop utilization.

Thom Cannell's

American Brown Ale

(5 gallons/19 L, all-grain)

OG = 1.056 FG = 1.014
IBU = 44 SRM = 39 ABV = 5.4%

Thom Cannell is BYO's Projects author. Thom says, "This recipe is based on my attempt to create a beer similar to the luscious Abita Turbo Dog Brown Ale from a clone recipe in BYO. Though it appears overwhelmingly hoppy, the chocolate, biscuit and crystal provide enough sweetness to balance. It's such a nice beer that my local brew pub appropriated the recipe and has brewed it the last two years."

Ingredients

4.5 lbs. (2.0 kg) Maris Otter pale ale malt
4.5 lbs. (1.7 kg) light Munich malt (10 °L)
1.2 lb. (0.54 kg) crystal malt (120 °L)
9.75 oz. (0.28 kg) Belgian chocolate malt
9.75 oz. (0.28 kg) Belgian biscuit malt
9.75 oz. (0.28 kg) torrefied wheat
8.5 AAU Target hops (80 mins)
(0.97 oz./27 g of 8.8% alpha acids)
4 AAU Willamette whole hops (20 mins)
(0.72 oz./21 g of 6.6% alpha acids)
1.6 oz. (45 g) Willamette whole hops (0 minutes)
White Labs WLP006 (British Ale) yeast
(2 qt. (~2 L) active starter, or, preferably, the packed cells from double that amount)
0.75 cups corn sugar (for priming)

Step by Step

Mash in at 141–149 °F (61–65 °C) for greater fermentability due to high percentage of unfermentables. Use a thick mash, approximately 10 qts. (9.4 L) of 154 °F (68 °C) water. Rest for 10–20 minutes. Then add 170–190 °F (77–88 °C) water to 153 °F (67 °C) — this will take approximately 7–10 qts. (~7–10 L) — and rest for 30 minutes. Recirculate (RIMS), heat (if mashing in kettle) or add boiling water to raise temperature to 168–170 °F (76–77 °C) to mash out. If you choose the latter, use a smaller second addition of higher heat water so not to thin out the mash. Sparge to produce enough wort — approximately 6 gallons (23 L) — for a post-boil volume of 5.0 gallons (19 L). 90 minute boil. Hops in at 80, 20 and 0 minutes remaining. Whirlpool and cool. Pitch yeast. Ferment at 65–68 °F (18–20 °C) for one week. Rack to secondary for 1–3 weeks.

Denny Conn's

Cream Swill (Cream Ale)

(5 gallons/19 L, partial mash)

OG = 1.040 FG = 1.006
IBU = 26 SRM = 3 ABV = 4.4%

Denny Conn wrote "Give Rye a Try" in the May–June 2004 issue of BYO and "Cheap and Easy Batch Sparging" in the January–February 2004 issue. Denny says, "This turns out so well as a mini-mash beer that I've never been tempted to come up with an all-grain version."

Ingredients

3.0 lbs. (1.4 kg) dried rice extract
2.0 lbs. (0.91 kg) light dried malt extract
1.0 lb. (0.45 kg) 6-row pale malt (US)
0.50 lbs. (0.23 kg) flaked maize
7.5 AAU Horizon hops (45 mins)
(0.56 oz./16 g of 13.4% alpha acids)
0.30 oz. (8.5 g) Horizon hops (0 mins)
1 tsp yeast nutrient
Wyeast 1056 (American Ale) or White Labs WLP001 (California Ale) yeast
1 cup corn sugar (for priming)

Step by Step

Mash 6-row malt and flaked maize at 155 °F (68 °C) with 2 qts. (~2 L) water. Sparge grains with 2 qts. (~2 L) of water at 170 °F (77 °C). Add wort from this partial mash to kettle, add water to 6.5 gallons (25 L) and add extracts. Boil 90 minutes. Hop to schedule. Primary fermentation lasts about 7 days at 65 °F (18 °C). Rack to secondary for 2 weeks at 45 °F (7.2 °C).

Anita Johnson's

Kölsch

(5 gallons/19 L, all-grain)

Kölsch
Sterling Pilsner (Bohemian Pilsner)
B3's California Common
Flemish Red Ale
MC Hawking's Event Horizon

OG = 1.046 FG = 1.011
IBU = 31 SRM = 4 ABV = 4.4%

Anita Johnson, owner of Great Fermentations of Indiana, in Indianapolis wrote "Lighten Up!" — a story about brewing light-colored extract beers — in the October 2002 issue of BYO. Anita says, "This Kölsch recipe is a crowd pleaser. We have served it at homebrew club meetings, public beer festivals and in the Indy Runners' recovery tent at the Indianapolis 500 Festival Mini Marathon (the country's largest ½ marathon). I like this beer because it has lots of flavor but is light and thirst-quenching. The Wyeast 2565 leaves a tartness that I really like. So simple but yet so good!"

Ingredients

7.85 lbs. (3.56 kg) Pilsner malt
1.4 lbs. (0.64 kg) wheat malt
8 AAU Spalt hops (60 mins)
(1.4 oz./40 g of 5.7% alpha acid)
Wyeast 2565 (Kölsch) or White Labs WLP029 (German Ale/ Kölsch) yeast
1 cup corn sugar (for priming)

Step by Step

Mash at 148–150 °F (64–66 °C) for a drier finish. Boil for 60 minutes, adding hops at the beginning of the boil. Ferment at 65 °F (18 °C).

Steve Piatz's
Sterling Pilsner (Bohemian Pilsner)
(5 gallons/19 L, all-grain)

OG = 1.056 FG = 1.014
IBU = 45 SRM = 3 ABV = 5.4%

Steve Piatz wrote "Lambic Brewing" in the October 2004 issue of BYO. Steve says, "Sterling Pilsner is a Bohemian Pilsner and is unique only in the use of all Sterling hops rather than the traditional Saaz hops. The first batch was the result of winning a sample of really fresh Sterling hops from HopUnion in a contest back when Sterling wasn't widely available. According to HopUnion Sterling was released in 1998 and is perceived as similar to a Saaz and Mt. Hood combination and is finding favor as a Saaz replacement. Since my water supply is extremely high in carbonates and Pilsen's water is very low in mineral content, I blended 0.5 gallons (~2 L) of my water with enough reverse osmosis water to make the batch."

Ingredients

11.25 lbs. (5.1 kg) 2-row Pilsner malt (US)
10.5 AAU Sterling hops (90 mins)
(1.75 oz./49.7 g of 6% alpha acids)
1.2 AAU Sterling hops (15 mins)
(0.2 oz./5.7 g of 6% alpha acids)
0.3 AAU Sterling hops (10 mins)
(0.05 oz./1.4 g of 6% alpha acids)
0.3 AAU Sterling hops (5 mins)
(0.05 oz./1.4 g of 6% alpha acids)
0.3 AAU Sterling hops (0 mins)
(0.5 oz./14 g of 6% alpha acids)
White Labs WLP800 (Pilsner) or White Labs WLP802 (Czech Budejovice) yeast
0.75 cups corn sugar (for priming)

Step by Step

Mashed with 3.75 gallons (14 L) of water at 152 °F (67 °C) for 30 minutes (until converted). Sparge the mash with 168 °F (76 °C) water until you collect 6.4 gallons (24 L) of wort in the kettle. The 90 minute boil will reduce the wort to 5.7 gallons (22 L) before chilling and will yield the target 5.5 gallons (21 L) of wort after chilling. Add a tablet of Whirlfloc for the last 20 minutes of the boil. Alternatively, you can use Irish moss for the last 20 minutes. At the end of the boil, the wort is chilled to the fermentation temperature — 52 °F (11 °C) — and the yeast is pitched from a large starter. Ferment at 52 °F (11 °C). Once the fermentation is nearly complete, do a diacetyl rest by letting the beer warm up to around 60 °F (16 °C) and leave it at that temperature for a day or so to allow the yeast to metabolize the diacetyl and then start a slow (4 °F/2 °C drop per day) chill down to a lagering temperature of 30–32 °F (-1.1–0 °C). Even a couple of weeks of lagering will help mellow the flavors; but 6 to 14 weeks is even better. Tradition calls for lagering a light colored beer like a Pilsner from 3 to 7 days per 4 specific gravity points of the original gravity or, for a 1.056 OG, from 42 to 98 days.

At the end of the lagering, the beer should be clear and is ready to drink once carbonated. If you keg your beer just adjust the pressure to hit around 2.3 volumes of CO_2. If you want to bottle condition your beer, you should consider adding a fresh lager yeast along with the priming sugar since there won't be much viable yeast left after the long lagering stage. An alternative approach for bottle conditioning is to bottle the beer after the diacetyl rest and then keep the beer at primary fermentation temperature (52° F) for a couple of weeks to allow the beer to carbonate, then you can lager the carbonated beer in the bottles.

Extract Option:

If you can perform a full-wort boil, use 6.25 lbs. (2.8 kg) of very light colored dry malt extract in place of the Pilsner malt. Stovetop brewers could boil 3 lbs. 2 oz. (1.4 kg) of Muntons Light dried malt extract in 2.5 gallons (9.5 L) of water then add 4.25 lbs.

(1.9 kg) of Alexander's Pale liquid malt extract for the final 15 minutes of the boil.

B3's California Common

(5 gallons/19 L, extract with grains)

OG = 1.050 FG = 1.013
IBU = 47 SRM = 12 ABV = 4.9%

Jason Petros, of Beer, Beer and More Beer, sent us his recipe for a California Common beer. The folks at "B3" — which is also celebrating its 10th anniversary — have contributed to BYO *many times in the past. Colin Kaminski, a designer for B3, wrote "Your Indoor Brewery," in the November 2002 issue of* BYO *and "How Clear is Your Beer" in the July–August 2002 issue.*

Ingredients

7.0 lbs. (3.2 kg) ultralight liquid malt extract
1.0 lb. (0.45 kg) crystal malt (60 °L)
10.2 AAU Northern Brewer hops (60 mins)
(1.5 oz./43 g of 6.8% alpha acids)
6.8 AAU Northern Brewer hops (10 mins)
(1.0 oz./28 g of 6.8% alpha acids)
1.0 oz. Northern Brewer hops (1 mins)
1 pkg Whirlfloc (15 mins)
Wyeast 2112 (California Lager) or White Labs WLP810 (San Francisco Lager) yeast
1 cup corn sugar (for priming)

Step by Step

Steep grains at 152 °F (67 °C) for 30 minutes. Boil wort for 60 minutes, adding hops at times given. Ferment at 55–63 °F (13–17 °C).

Paul Zocco's
Flemish Red Ale

(5 gallons/19 L, all-grain)

OG = 1.061 FG = 1.015
IBU = 21 SRM = 27 ABV = 5.9%

Paul Zocco, owner of Zok's Homebrewing Supplies, in Willimantic, Connecticut wrote "Apple Cider: The Flavor of Autumn," in the November 2004 issue of BYO. Paul says, "I recently spent a day at Rodenbach inhaling a few Grand Crus, the best Flemish Red there is. This beer has won many golds in New England competitions and recently it made the second round in the 2005 National Homebrew Contest."

Ingredients

7.0 lbs. (3.2 kg) Muntons American Style Malt (1.7 °L)
1.5 lbs. (0.68 kg) flaked maize
1.0 lb. (0.45 kg) Vienna malt
1.4 lbs. (0.64 kg) CaraMunich malt
10 oz. (0.28 kg) acid malt
8 oz. (0.23 kg) wheat malt
8 oz. (0.23 kg) biscuit malt
3 oz. (85 g) chocolate malt
2 oz. (57 g) Special B malt (160 °L)
1 lb. (0.45 kg) rice hulls
2 AAU Styrian Goldings hops (60 mins)
(0.5 oz./14 g of 4% alpha acids)
4.6 AAU Northern Brewer hops (30 mins)
(0.5 oz./14 g of 9.1% alpha acids)
2 AAU Styrian Goldings hops (5 mins)
(0.5 oz./14 g of 4% alpha acids)
Wyeast 3278 (Lambic Blend) mix and Wyeast 1028 (London Ale) yeast
1 ¼ cup light dried malt extract (for priming)

Step by Step

Mash at 150 °F (66 °C) for 1 hour. Sparge with 170 °F (77 °C) until you get 6 gallons (23 L), to be boiled down to 5 gallons (19 L). Ferment 2 weeks at 70 °F (21 °C). Transfer to secondary for 2 weeks at 70 °F (21 °C). Bottle with priming extract.

Brew Your Own's
MC Hawking's Event Horizon

(Raspberry Wheat)

(5 gallons/19 L, extract with fruit)

virtual OG = 1.044 (1.040 before fruit)
FG = 1.011 IBU = 14
SRM = 4 (before fruit) ABV = 4.2%

Here's one we developed especially for this recipe collection. This beer takes less than 90 minutes to make on brewday. For best results, follow the instructions closely — even though some of the steps are a bit unusual. MC Hawking's Event Horizon is a crisp, wheat beer accentuated by the raspberries, which add a tart, fruity note. This beer will disappear like it's been sucked into a black hole.

Ingredients

2.0 lbs. (0.91 kg) Briess Wheat dried malt extract
3.3 lbs. (1.5 kg) Coopers Wheat malt extract (liquid, canned)
6.0 lbs. (2.7 kg) frozen raspberries
6 AAU Perle hops (30 mins)
(0.86 oz./24 g of 7 % alpha acids)
1 tsp Irish moss
¼ tsp yeast nutrients
DCL Safale US-56 (dried yeast)
Wyeast 3068 (Weihenstephan Wheat) or White Labs WLP300 (Hefeweizen) yeast
1.2 cups corn sugar (for priming)

Step by Step

Use distilled or soft water. Heat 2 gallons (7.6 L) of water to a boil, then turn off heat. Stir in dried malt extract and bring to a boil. Add hops and boil for 30 minutes, adding Irish moss and yeast nutrients with 15 minutes left in boil. Shut off heat. Wipe off the outside of malt extract can with a paper towel soaked in sanitizing solution, then open and pour extract into hot wort. Sanitize a spoon to get the last bit of extract out of the can. Stir wort with this spoon until you think the extract is dissolved, then stir 1 minute longer. (The extract in the can is sterile, so there's no need to boil it for sanitation.) Cool wort immediately and transfer to fermenter. Add water to make 5 gallons (19 L) and aerate. (The specific gravity at this point will be 1.040.) Pitch both dried and liquid yeasts and ferment at 72 °F (22 °C). After primary fermentation ends (in 3–4 days), sanitize a bucket and add frozen raspberries. Mash raspberries with sanitized potato masher, then rack beer on top of them. (There's no need to heat the raspberries to sanitize them.) Place lid loosely on bucket, but don't seal until foaming from fruit subsides (usually 2–3 days). Seal bucket and let beer sit in contact with fruit for 10 days total. Bottle with corn sugar or keg and carbonate to 2.8–3.0 volumes of CO_2.

Note: Recipes have been scaled to 5 gallons (19 L) and adjusted, if needed, to match *BYO's* assumptions for extract efficiency, potential extract and hop utilization.

INTERNATIONAL LAGERS

GO FULL-THROTTLE for the green bottle

In 1842, the beer world changed forever. In that year, a little-known brewery in what is now Pilsen (Plzen), Czechoslovakia brewed a clear, golden lager. Subsequently, brews adapted from this original Pilsner beer spread across the globe. The basic, widely-brewed version of this beer style could simply be called International lager. This name emphasizes its ubiquity and the fact that, for many people around the world — especially those in countries without a vibrant beer culture — this style defines the word "beer."

In the US, beer drinkers know these beers — beers like Heineken, Becks, Grolsch, St. Pauli Girl and the like — in their green-bottled import versions.

You might think that these beers would be the last thing on the minds of homebrewers, who tend to gravitate more to hoppy, big or dark beer styles. However, if you read the online brewing forums, requests for "Heinie" clones pop up at a surprisingly high frequency. (And, it's our most requested Replicator clone.)

I based the recipes in the article on Heineken, but all of these beers taste very similar. Of all the beers you could brew, an International lager is one that will highlight your skills as a brewer the most. There's nothing for faults to hide behind in this beer, so you really have to pay attention to how you brew it. Keep in mind that even the big commercial breweries don't do this flawlessly — they achieve some of their consistency through blending. Here's how you can brew one at home.

by **Chris Colby**

photo by charles a. parker/images plus

RECIPES

Grab My Heinie

(undiluted base beer)
(5 gallons/19L, all-grain)
OG = 1.053 FG = 1.007
IBU = 25 SRM = 5 ABV = 6.0%

(post-dilution — 6 gallons/23L)
virtual OG = 1.045 FG = 1.006
IBU = 21 SRM = 4 ABV = 5.0%

Ingredients
8.0 lbs. (3.6 kg) 2-row Pilsner malt
5.0 oz. (0.14 kg) Weyermann acidulated malt
4.0 oz. (0.11 kg) CaraPils malt
2.4 lbs. (1.1 kg) corn grits
2 tsp Irish moss
¼ tsp yeast nutrients
6.6 AAU Magnum hops (60 mins) (0.41 oz./12 g of 16% alpha acids)
0.13 oz. (3.5 g) Saaz hops (15 mins)
Wyeast 2024 (Danish Lager) or White Labs WLP850 (Copenhagen Lager) yeast (3 qt./~3 L yeast starter)
2 tsp. Polyclar AT (fining agent)
1 gallon (3.8 L) deaerated water (for blending)
1.25 cups corn sugar (for priming)

Step by Step

Heat 12 quarts (11 L) of water to 142 °F (61 °C) in your kettle. Set aside 1.0 lb. (0.45 kg) of Pilsner malt. Mash remaining grains at 131 °F (55 °C). Make cereal mash by combining 5.0 quarts (4.7 L) of water with grits and 1.0 lb. (0.45 kg) Pilsner malt, heat to 158 °F (70 °C) and hold for 5 minutes. Then heat to a boil, stirring constantly. Boil cereal mash for 15 minutes. After main mash has rested 15 minutes, begin heating it to 140 °F (60 °F). Stir this mash as well. (It helps to have a brewing partner.) Hold main mash at 140 °F (60 °C) for 15 minutes. Stir cereal mash into main mash and adjust temperature to 152 °F (67 °C). Hold for 45 minutes, then heat to 170 °F (77 °C). Transfer mash to lauter tun and recirculate wort for 20 minutes, then begin running off wort. Sparge with 190 °F (88 °C) water until the top of the grain bed reaches 170 °F (77 °C), then sparge with 170 °F (77 °C) water. Boil for 90 minutes. Add a pinch of calcium ($CaCl_2$ or gypsum) at the beginning of the boil. Add hops at times indicated in recipe. Add Irish moss and yeast nutrients with 15 minutes left in the boil. After boil, cool quickly and transfer to fermenter. Aerate and pitch yeast sediment from yeast starter. Ferment at 53 °F (12 °C) until terminal gravity is within 3 "gravity points" of final gravity. Let temperature rise to 60 °F (16 °C) for a diacetyl rest. Cool to 30–40 °F (-1.1–4.4 °C) and lager for 4–6 weeks. Add 2 tsp Polyclar AT to beer the night before you keg or bottle it. Dilute to 6 gallons (23 L) of finished beer by blending base beer with 1 gallon (3.8 L) of deaerated water. Package in keg or green bottles.

Grab My Heinie

(5 gallons/19L, extract with grains)
OG = 1.045 FG = 1.006
IBU = 21 SRM = 4 ABV = 5.0%

Ingredients
2.0 lbs. (0.91 kg) 2-row Pilsner malt
13.6 oz. (0.39 kg) Laaglander Light dried malt extract (DME)
2.5 lbs. (1.13 kg) Coopers Light liquid malt extract (LME)
1 lb. 7 oz. (0.65 kg) brewers corn syrup
1 tsp Irish moss
¼ tsp yeast nutrients
5.4 AAU Magnum hops (60 mins) (0.33 oz./9.6 g of 16% alpha acids)
0.10 oz. (2.8 g) Saaz hops (15 mins)
Wyeast 2024 (Danish Lager) or White Labs WLP850 (Copenhagen Lager) yeast (2 qt./~2 L yeast starter)
1.5 tsp. Polyclar AT (fining agent)
1.0 cup corn sugar (for priming)

Step by Step

Put crushed Pilsner malt in a nylon steeping bag. In a large (8 qt./8 L or bigger) kitchen pot, heat 3 qts. (~3 L) of water to 169 °F (76 °C), turn off heat and dunk steeping bag. Steep grains for 45 minutes. If steeping temperature falls below 148 °F (64 °C), heat slowly to 158 °F (70 °C). (This is actually a partial mash, so follow temperatures and liquid amounts closely.) While grains are steeping, heat 2.0 gallons (7.6 L) of water to 180 °F (82 °C) in your brewpot. When steep is over, add 2 quarts (~2 L) of hot water from kettle to the "grain tea" in the steeping pot. Remove grain bag and place in colander over brewpot. Pour the diluted "grain tea" through the grains in the steeping bag. Discard grain bag, add DME and corn syrup to the liquid in the kettle and bring to a boil. Once the foam subsides, add hops and begin the 60 minute boil. With 15 minutes left in boil, add Saaz hops, Irish moss and yeast nutrients, then turn off heat and stir in LME. Resume heating once LME is completely dissolved. (Keep boil clock running.) After boil, cool wort quickly and transfer to fermenter. Add water in fermenter to make 5 gallons (19 L). Follow remaining all-grain instructions, except for dilution to 6 gallons (23 L).

INGREDIENTS

Soft Water To brew an International lager, you need to use water with a low level of dissolved minerals (i.e. "soft" water). Ideally, the water should contain 50 ppm calcium ions (Ca^{2+}) or less and as close to no carbonate ions (HCO^{3-}) as is possible. "Soft" water gives the beer a rounded flavor that de-emphasizes the hop bitterness.

The easiest way to get appropriately "soft" water is to dilute your tap water with either distilled water or water treated by reverse osmosis (RO water). Then, you can add calcium chloride ($CaCl_2$) or calcium sulfate (from gypsum, $CaSO_4*7H_2O$) to hit the calcium ion target. If you have a water report from your local utility and access to brewing software, you can figure out the exact plan for your water treatment. If you don't — but you know that your water is soft, medium or hard — follow one of the simple water treatment plans below.

Water for Extract Brewers You will need about 6 gallons (23 L) of water total to make your 5 gallons (19 L) of extract beer. As an extract brewer, you will not need to worry about the level of calcium in the water. So, you really have two options:

The best option is to simply brew the beer using distilled water and let the minerals in the malt extract determine the mineral content in your wort.

Your second option is to dilute your local water with distilled water. If you have soft water, dilute it 1:1 with distilled water. If you have "medium" water — not particularly soft or hard — dilute your tap water 3:1 (4.5 gallons (17 L) of distilled water and 1.5 gallons (5.7 L) of medium tap water). For hard water, dilute 6:1.

Water for All-Grain Brewers All-grain brewers will need about 12 gallons (45 L) of water for their 5-gallon (19-L) batch of beer and they will need to consider the calcium ion content. Follow the dilution rates for soft, medium and hard waters given above, but make 12 gallons (45 L) of brewing liquor. Then, add 2.5 tsp of calcium chloride ($CaCl_2$) to it. (Alternately, add 2.5 tsp of gypsum.) This should put your calcium and carbonate ions levels in the ballpark.

Pale Malts A good International lager has a nice, pale malty/grainy character. To get this character, all-grain brewers should use 2-row Pilsner or lager malt as their base malt. If you want, you can also add around 0.25–0.50 lbs. (0.11–0.23 kg) of CaraPils malt per 5 gallons (19 L). This will add a little extra body to your beer. Keep in mind, though, that these are fairly light-bodied beers and the amount of body can also be influenced by your mash variables.

A small amount of acidulated malt — around 0.25 lbs. (0.11 kg) per 5 gallons (19 L) — may also be helpful. The pH of a mash made with pale malt in soft water may be a little higher than optimum and adding some acidulated malt can lower it.

Extract brewers should select the lightest-colored, all-malt extract they can find. If you use liquid malt extract (LME), make sure it is fresh — stale LME will be darker than you want it to be. The real trick for extract brewers — especially stovetop brewers — will be to use procedures that will not darken the extract excessively during the boil. (See the recipe on page 40 for the details. See also "Extract Experiments," in the October 2004 issue for more on brewing light extract beers.)

Corn to Lighten the Body Like American Pilsners, International lagers use corn as an adjunct. However, since 2-row pale barley malt has fewer enzymes than the 6-row malt used to make American Pilsners, the percent of corn in International lagers is held to 20–25%, compared to the 30–40% used in American Pilsners. All-grain brewers have the options of using flaked maize, grits or brewers corn syrup as their adjunct; extract brewers can only utilize brewers corn syrup. (Note: Supermarket corn syrup often contains vanilla. If your local homebrew shop doesn't carry brewers corn syrup, do an Internet search for "brewers corn syrup" or "brewery grade corn syrup.") The adjunct lowers the body of the beer and decreases the level of protein in the wort, but does not lend a strong corn flavor to the beer.

Neutral Hops International lagers have a light hop bitterness (around 20–25 IBU) to balance the malty and sweet

flavors in the beer. Any "neutral" bittering hop will work well. For a finishing hop, Saaz is a popular choice.

Lager Yeast Ferment your International lager with lager yeast. Good choices are Wyeast's 2024 (Danish Lager), 2247 (European Lager) or 2124 (Bohemian Lager) or White Labs WLP830 (German Lager), WLP850 (Copenhagen Lager) or WLP940 (Mexican Lager) yeasts.

To raise enough yeast for a healthy fermentation, make a 2–3 quart (~2–3 L) yeast starter at a specific gravity around 1.035. (You'll need 6–9 oz. (170–255 g) of dried malt extract for this.) As you will be fermenting a relatively adjunct-rich wort in very soft water, it might pay to make your yeast starter with tap water and add some yeast nutrients (around ⅛ tsp per starter). Once the starter has fermented, pitch only the yeast sediment.

PROCESS

Planning Most (probably all) International lagers are made by a process called high gravity brewing. In it, the brewer ferments a strong beer then dilutes it to working strength before packaging. Commercial brewers make their strong beer around 14–16 °Plato (OG 1.056–1.064), for a beer around 6–7% ABV. This beer is diluted so that the original gravity would have been around 10–11 °Plato (1.040–1.044 virtual OG), for the final 5% ABV beer. For a homebrewed International lager, you can make 5 gallons (19 L) of beer at around 6% alcohol by volume (ABV) and dilute it to 6 gallons (23 L) at around 5% ABV. The all-grain recipe accompanying this article follows this plan. The beer from the extract recipe will not be diluted.

Mash (and cereal mash) All-grain brewers can either add flaked maize to their mash or do a cereal mash using corn grits. (See the March-April 2005 *BYO* for more on cereal mashing.)

A single infusion mash at 148–150 °F (64–66 °C) will work fairly well, especially if you are using only pale malt and flaked maize (i.e. no CaraPils malt). However, a step mash will give you a more highly-fermentable wort that is more appropriate for the style.

. . . the brewer ferments a strong beer then dilutes it to working strength before packaging.

One easy way to do this is to mash in your kettle. Mashing in your kettle allows you to apply direct heat to the mash to raise the temperature between rests. Be sure to stir well as you heat, though.

Here's a mash program that has worked well for me when making light lagers. Mash in at 131 °F (55 °C), with a mash thickness of about 1.5 quarts of water per pound of grain (13 L/kg), and hold at this temperature for 10–15 minutes. If you are using flaked maize, include it with the grains at mash in. If you are doing a cereal mash, begin that immediately after mashing in. After the rest at 131 °F (55 °C), heat the mash to 140 °F (60 °C), stirring almost constantly. While heating, raise the temperature a couple of degrees Fahrenheit (one degree Celsius) per minute. Hold mash at 140 °F (60 °C) for another 15 minutes. Then, stir in your cereal mash (if you used grits) and add heat to raise temperature to 152 °F (67 °C). Hold here for 45 minutes. Finally, heat your mash to 170 °F (77 °C) and transfer it to your lauter tun. (The temperature will drop a few degrees, unless you've heated your lauter tun.) Let the mash sit for 5 minutes, then recirculate.

When you begin collecting wort, heat the sparge water to 180–190 °F (82–88 °C) to raise grain bed temperature to 170 °F (77 °C). Once the grain bed reaches that temperature, add some cool water to your hot liquor tank to bring it down to 170 °F (77 °C). Collect the wort over 90 minutes, stopping collection when either the specific gravity falls below 1.008 or the pH climbs past 5.8.

Boil Hard All-grain brewers should boil the wort vigorously for 90 minutes. Adjust your burner so you get the proverbial full rolling boil and end up with 5 gallons (19 L) of wort. A vigorous boil will ensure good hot break formation and DMS (dimethyl sulfide) volatilization. Add a pinch of calcium (less than 1/16 tsp $CaCl_2$ or gypsum) at the beginning of the boil — this will help with your hot break, lower your wort pH slightly and keep wort darkening to a minimum. One or two teaspoons of Irish moss added in the last 15 minutes of the boil will help with clarity.

In the extract recipe, the total boil time is 60 minutes. For the first 45 minutes, only the wort from the partial mash, along with some dried malt extract, is boiled. Liquid malt extract (LME) is added for the final 15 minutes of the boil — decreasing the amount of wort darkening associated with boiling a "thick" wort.

Cool Quickly Cool your wort as quickly as is feasible to fermentation temperature. In beers made from very pale malts, DMS can be a problem if the wort is cooled too slowly. DMS adds a cooked corn-like flavor to beer and most brewers strive to avoid this.

Extract brewers should cool their wort before transferring it to their fermenter. Although it's easy to dump hot wort into cold water to cool it, if hot wort splashes around too much it will darken. Cool the wort either in your sink or with an immersion wort chiller.

Ferment For best results, ferment your International lager within the usual lager fermentation temperature range — 48–56 °F (9–13 °C). When primary fermentation is complete, or nearly so, let the temperature rise to 60 °F (16 °C) for a diacetyl rest. Diacetyl will give beer a buttery or butterscotch-like off flavor. A one or two day rest should be fine, but taste a sample of the beer to be sure.

The final specific gravity of most International lagers is in the 1.005–1.007 range, with the strong

beer being correspondingly higher. In the all-grain recipe, your strong beer should finish fractionally above 1.007 and end up at 1.006 upon dilution.

Lagering Length Commercial lagers are not lagered for long — around three weeks is fairly common. Filtering the beer helps speed the lagering process, though. Therefore, for unfiltered homebrew, lager a little longer (around 5–6 weeks) for the beer to get past the green stage.

Packaging Clarity is important in this style of beer. If you have a filter, this would be the type of beer to use it on. If not, add Polyclar AT to your lagered beer the night before you bottle or keg it. This fining agent will drag excess haze-causing tannins in the beer to the bottom of your secondary fermenter. For 5 gallons (19 L) of beer, stir 2 tsp. of Polyclar into a couple ounces (~60 mL) of water that has been boiled, then cooled to room temperature. Dump this mixture in the beer and stir quietly a couple times with a sanitized spoon. The Polyclar will settle out within about 6 hours and be left behind when you rack the beer.

If you did not use the high gravity method, just bottle or keg it as you usually would. If you made 5 gallons (19 L) of strong beer, dilute it to 6 gallons (23 L) of working strength beer with one gallon (3.8 L) of distilled, deaerated water. To make deaerated water, boil 1.5–2 gallons (5.7–7.6 L) of water hard for 15 minutes. Cool this water quickly, without splashing it, to at least room temperature. (If you have a keg carbonation stone, you may want to bubble CO_2 through the water for a minute or so once it has been cooled.) Quietly siphon one gallon (3.8 L) of this water to your bottling bucket or keg, then siphon your strong beer into it. If bottling, stir the beer lightly before you begin filling bottles.

If you're kegging, 6 gallons (23 L) can be an inconvenient amount. One option is to bottle five 22-oz. (650 mL) bottles of your strong beer first. Next, dilute the remaining 4.16 gallons (15.7 L) of 6% ABV beer to 5.00 gallons (18.9 L) of 5% ABV beer. This way you have a Corny keg, and a few bomber bottles of malt liquor on the side.

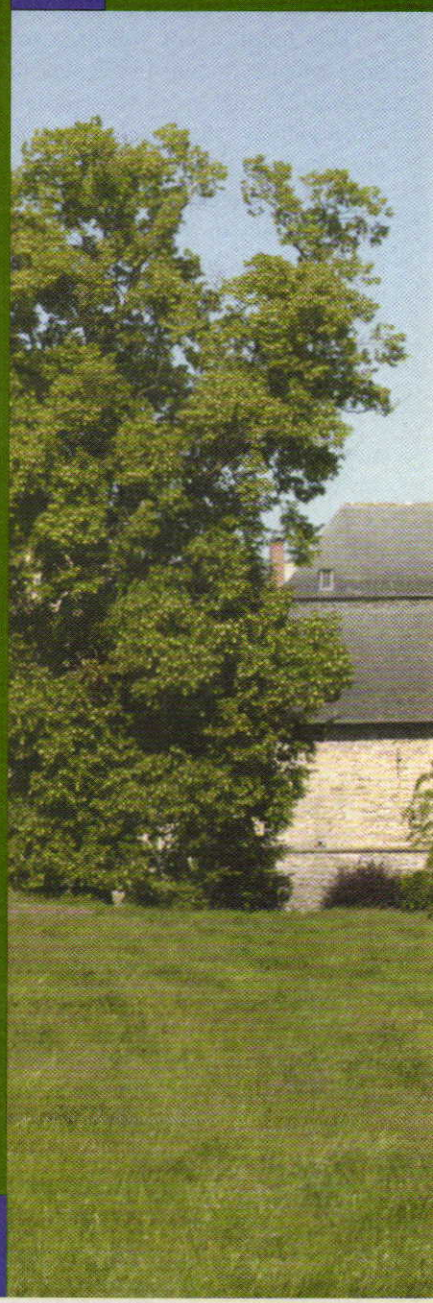
International lagers are fairly fizzy, so bottle with 1 cup of corn sugar per 5 gallons (19 L) or adjust the temperature and pressure of your kegging system to obtain around 2.6 volumes of CO_2 per volume of beer.

Enter the Skunk If you want to be authentic to the bottled versions of International lagers available in the US, many of which have that "Euro skunk" aroma, put your beer in green bottles. If the bottles are exposed to sunlight or UV light, they will skunk. If you prefer your beer unskunked, put it in brown bottles.

A Dry Finish Given that you can't completely exclude oxygen from your dilution water at home, drink your beer within 2–3 months or if it begins to show signs of oxidation.

by
Michael Heniff

photos courtesy of Belgian Tourist Board



Saison

a farmhouse brew for all seasons

BELGIUM IS HOME to literally dozens of styles of beer, many of them found only in Belgium. One style that is quite rare, even in Belgium, is the saison. Saisons originated as quaffing beers brewed at farmhouses during the 18th Century, but are only found sporadically in their native Wallonian region of western and southern Belgium. Today, more and more craft brewers in America brew representations of this traditional style.

Brewed in farmhouses, traditional saison brewers are essentially homebrewers who produce wonderfully complex beers.

Mike's Best Saison

(5 gallons/19 L, all-grain)
OG = 1.070 FG = 1.010
IBU = 40 SRM = 4–5 ABV = 7.7%

Ingredients:
12.0 lb (5.5 kg) Belgian Pilsner malt (1.4–1.8 °L)
0.9 lb (0.4 kg) CaraPils malt (6–9 °L)
1.5 lb (0.7 kg) Vienna malt (3–4 °L)
9.1 AAU German Perle hops (60 min) (1.3 oz./37 g of 7% alpha acids)
3.8 AAU English Kent Goldings hops (10 min) (0.75 oz./21 g of 5% alpha acids)
1.3 AAU English Kent Goldings hops (0 min) (0.25 oz./7 g of 5% alpha acids)
1.8 AAU Czech Saaz hops (0 min) (0.5 oz./14 g of 3.5% alpha acids)
1 tsp coriander (coarsely crushed)
1 tsp sweet orange peel (coarsely crushed)
White Labs WLP565 (Belgian Saison) or Wyeast 3724 (Belgian Saison) yeast

Step by Step

Mash grains at 152 °F (67 °C) for 90 minutes. Boil wort for 75 minutes adding hops per scheduled times and spices with 5 minutes left in boil. Cool wort to room temperature and drain or rack the wort off of the trub. Aerate the cool wort with as much air or pure oxygen as possible. Ferment at 75 °F (24 °C) for 3 weeks in the primary and 3 weeks in the secondary.

Brewery Ommegang Hennepin clone

By Steve Bader
(5 gallons/19 L, extract only)
OG = 1.070 FG = 1.008 IBU = 24 ABV = 8.0%

Ingredients
6.6 lbs. Muntons light malt extract syrup
0.5 lbs. Muntons light malt extract powder
2 lbs. light candi sugar
6.5 AAU Styrian Golding hops (bittering hop) (1.25 oz. of 5.25% alpha acid)
1.75 AAU Saaz hops (bittering hop) (0.5 oz. of 3.5% alpha acid)
1 tsp. Irish moss
1 oz. dried ginger root
1 oz. bitter orange peel
White Labs WLP550 (Belgian Ale) or Wyeast 1214 (Belgian Abbey) yeast
0.75 cups corn sugar (for priming)

Step by step

Boil 3 gallons of water. Remove from heat and stir in the malt syrup, powder and candi sugar. Resume heating and bring the wort to a boil. Add Styrian Golding (bittering) hops, Irish moss and boil for 60 minutes. Add the ginger root and bitter orange peel for the last 15 minutes of the boil. Add 0.5 ounce of Saaz (aroma) hops for the last two minutes of the boil. When done boiling, strain out hops, add wort to two gallons of cool water in a sanitary fermenter, and top off with cool water to 5.5 gallons. Cool the wort to 80 °F, aerate the beer and pitch your yeast. Allow the beer to cool over the next few hours to 68–70 °F and ferment for 10–14 days. Bottle and age for 2–3 weeks. Enjoy!

Old Farmhouses and New Revivalists

Farmhouse brewing in the 19th century had quite a significant seasonal relevance and served many purposes at each farmhouse brewery. "Saison" literally translates in French as "season." At the farmhouse, brewing served as a means to preserve the late harvest grains while occupying the time of the farm workers during the cold winters in north central Europe. This winter brew was then available to quench the thirst of the workers during the labors of working the farm in the summer.

Traditionally, farmhouse brewers used barley and whatever other grains that may be available on the farm, which included spelt, buckwheat, oats or rye. The wort was highly hopped with hops from northern Belgium and France. Any number of spices were added as well. Brasserie Vapeur, where their saison is an original recipe from 1785, has so much ginger that it is very thirst quenching, even when the beer is warm. Other spices in this historical representation include Curaçao orange peel, coriander, ginger and black pepper.

Today, a handful of old farmhouse brewers still remain in Belgium along with a recent emergence of a number of new "artisanal" breweries that produce good examples of saisons. The traditional farmhouse breweries of Dupont, Silly, Vapeur (Saison de Pipaix), and du Bocq (Saison Regal) are joined by the newer revivalists of Fantome, Blaugies (Saison D'Epeautre), and Geants (Saison Voisin). In the US, craft brewers such as Ommegang (Hennepin), Brooklyn Brewery (Saison de Brooklyn), Southampton Publik House (of *Farmhouse Brews* author Phil Markowski), New Belgium, Pizza Port at Solana Beach (SPF8 and SPF45 saisons), to name just a few, have saisons in their portfolio.

The Taste of Wallonia

The style today is most often identified by the Dupont offering "Saison Dupont Vieille Provision," or just "Saison Dupont" as the new bottle label states. Saison Dupont is a cloudy golden ale with a huge mousse-like head and a complex aroma of peppery phenolics with a touch of fruits and a slight earthy hoppiness. The body of Saison Dupont is tangy from the high level of carbonation and gentle citrus fruits are highlighted by a well-balanced spicy hoppiness and an array of spicy yeast phenolics. A moderately tart and bitter finish cleanses the palate with touches of pepper and fruit lingering.

But, saison is more than just a style represented by a singular beer; it is more of a family of beers from a region, much due to local farmhouse preferences and grain availability as well as evolution of historical recipes. Dupont has stronger offerings than their saison, at 6.5% alcohol by volume (ABV), with their Moinette (at 8.5% ABV) and their massive 9.5% ABV winter offering Avec les Bons Voeux ("Best Wishes"). Other saisons such as Saison Silly, Saison Regal and Dupont's Moinette Brune highlight darker grains such as medium and dark caramel and darker Munich malts. Saison D'Epeautre has a delicate, almost perfume-like spiciness with 30% of the grist consisting of spelt. Saison de Pipaix has a strong spicing of ginger, black pepper, sweet Curaçao orange and coriander. Fantome's summer saison "Ete" has a stronger, but still very clean, acidity with a tropical fruitiness that resembles pineapple juice. Fantome also has a number of other seasonal selections with a wide range of top secret spices, fruit juices and "who knows what else" in their Printemps ("spring"), smoky Automne ("autumn"), fruity Hiver ("winter"), and the massive Noel (at 10% ABV).

Regardless of all of the possible variations, the best saisons display a harmonious melding of fruitiness and spiciness derived from the yeast, with a complimenting spicy and earthy hoppiness and a delicate spice character. All of this occurs in a beverage that is slightly tart and dry, refreshing, easy-to-drink, but yet still complex. Generally, saisons have an original specific gravity of 1.050 to 1.070 and finish at a specific gravity 1.005 to 1.014, resulting in a high apparent

attenuation of 75 to 90%. The bittering level, higher than most Belgian styles, weighs in at 30 IBU for the lower gravity examples and can reach as high as 45 IBU. The color of a saison can be all over the charts, but most of the examples are from a straw color of 5 SRM to a copper color of 14 SRM.

Brewing Saisons

The malt character for a saison should be light, but not overwhelm the hop, spice and yeast characters. Just about any Pilsner or pale malt can be used for the base malt; Pilsner malt will make a lighter, slightly less malty saison while pale malt will give the saison a slight malty character and a light orange hue. Light Munich or Vienna malt can be used up to 10–20% of the grain bill in order to add a slightly more complex and toasty malt character. Malted wheat can occupy up to 30% of the grain bill, and other cereal grains such as spelt or oats can be added in proportions less than 10% to give character and body. Historically, it is likely that unmalted wheat was also used.

A multiple-step infusion mash is used by many of today's saison breweries. A protein rest at 131 °F (55 °C) and saccharification rests at 149 °F (65 °C) and 160 °F (71 °C) are common. But, when working with the commonly available highly-modified malts, the protein rest can be eliminated. When mashing a saison grist, the low end of the saccharification temperature range should be used to produce a drier, more fermentable beer. Temperatures between 149 °F and 153 °F (65–67 °C) are recommended.

Saisons are quite hoppy compared to most other Belgian styles in bittering, flavor and aroma, but the hop character should not overwhelm the yeast or spice character. Varieties with a spicy character such as Saaz, Hallertauer and Styrian Goldings work well for saisons as the spiciness of the hops meld well with that of the spices and yeast. Kent Goldings is used in a few saisons as well, contributing a slight fruity and spicy character with an herbal or earthy character.

Spices are added to some, but not all, saisons and lend a complexity to the hop and yeast characters. The spice character is usually delicate — complementing the beer and adding a layer of complexity without being overly assertive. Spices such as coriander, sweet or bitter orange peel, grains of paradise, cardamom and ginger are among many that can be found in saisons. Spices are best added in late additions (with 0–5 minutes left in the boil) or added in the secondary fermenter. Since the strength and flavor of each of these spices can vary by source, it is strongly suggested to start by adding one or two spices to a recipe and adjusting based on results.

As with most other Belgian beer styles, yeast is the heart and soul of a saison. The yeast character of a saison is of a complex spicy and peppery

A variety of Belgian saisons from the Dupont, Vapeur, Lefebvre, Silly, Fantome and Blaugies breweries.

character with earthy and subtle fruity ester notes. The attenuation is high, leaving a dry finish and a gentle acidity. Some examples show a hint of *Brettanomyces*-derived notes.

The White Labs WLP565 (Belgian Saison) strain and the seasonally-available Wyeast 3724 (Belgian Saison) strain provide similar results. White Labs WLP550 (Belgian Ale) and Wyeast 3522 (Belgian Ardennes) strains are acceptable substitutes, but lack some of the earthy character and acidity.

The two saison strains are notoriously slow fermenters. Six to eight weeks in the primary and secondary fermenters may be required depending on a number of factors, including starting gravity, yeast starter size, fermentation temperature and cool wort aeration. A large yeast starter is suggested — I use a 0.5 gallon (~2 L) starter for a 5-gallon (19-L) batch. Aerate the cool wort as much as possible (using pure oxygen is suggested for best results). If the starting gravity is higher than 1.070, finishing the fermentation using a neutral secondary strain, such as White Labs WLP001 (California Ale) or Wyeast 1056 (American Ale), may be necessary. An alternate solution is to add corn sugar or Belgian candi sugar to the end of the boil (from 5 to 10% of the fermentables). The simple sugars are easier to ferment and will help the yeast attain a lower finishing gravity.

All four yeast strains produce good beer at high fermentation temperatures, which is typical of the fermentation techniques of saison brewers. White Labs lists the high end of the temperature range at 75 °F (24 °C) while Wyeast lists the maximum temperature for their strain at 85 °F (29 °C). I have conducted experiments at numerous temperature ranges. At 76 °F (24 °C), both the White Labs and Wyeast strains produced saisons with delicate and balanced esters and phenolics, with very little fusel alcohols, contrary to what one might expect. The higher fermentation temperature also resulted in a drier finish and higher attenuation than at the lower temperature of 68 °F (20 °C).

Mike Heniff wrote "Cleaning the Big Bottle," on keg maintenance, in the January-February 2005 issue.

Contest Strategy

How to go for the gold in homebrew contests

by Chris Colby

Imagine two hypothetical homebrew contests. In the first contest, every homebrewer submits a 5-gallon (19-L) Corny keg of homebrew. The judges taste a sample from each keg and then are free to drink from whichever keg they want. After the initial sampling, the contest becomes a party where judges hang out, listen to music, chat with other judges and — of course — drink beer. The first keg that is "kicked" wins Best of Show; the next, First Runner Up and so on.

In the second imaginary contest, every brewer submits a bottle a beer. Judges take one sip of each beer and assign it a score; highest score wins. If the exact same line-up of beers were entered in both contests, would the Best of Show winner be the same in both cases?

I think one can put together a fairly logical case that the two different contests would favor different types of entries. In the first case, judges would initially favor beers that made a good first impression, but they would settle on beers that proved nice to drink a whole pint of, or several pints of. Some beers that "wowed" the judges initially would prove to be tiresome in the long run while other beers with less initial impact might reveal their charms as session beers. In the second type of contest, all the judges have to go on was their initial impression.

In reality, homebrew contests are much more similar to the latter type of contest. (And, thankfully so — who wants to submit a whole keg to a contest?) Judges have limited contact with each entry and first impressions count. When brewing and submitting beers to a homebrew contest, it pays to think about the mechanics of how beers are evaluated. In this installment of Techniques, I'm going to discuss tips for brewing competitive beers for homebrew contests. I've judged at many homebrew contests and have submitted beers to a few. Of the beers I've submitted, some have done quite well while others have gotten shelled. (Many times, I've been surprised at which did well and which did poorly.)

Quality Counts

The advice I give below will be useless if you can't brew a decent beer. Although some strategy — and a bit of luck — does play a role in homebrews contests, they are not complete crapshoots. Quality beers rise to the top in homebrew contests and have a shot at winning. Poorly-made beers never go anywhere. If you've entered contests before and always scored poorly, you need to review your brewing fundamentals. On the other hand, if you've entered contests before and your scores have been all over the place and you can't figure out why, read on.

Judging is serious business, except when it isn't. The author (far right, seated) and others judging smoked beers at the 2004 National Homebrew Contest.

Enter Your Beer, Not Your Plan

The first thing you do when entering a homebrew contest is to decide on what category to submit your beers in. When doing this, forget what you intended to brew and examine how your beer actually turned out. Did you miss the target OG on your IPA? Then consider if it might score better as a pale ale.

Homebrew judges will not know what style of beer you were trying to make, what your ingredient list was, what procedures you used or anything other than the category you submitted your beer in. Evaluate your beer from this perspective when deciding on which category to enter. Read the style guidelines looking for any beer style that seems to describe what your beer tastes like. If you know someone who has judged at contests before, ask them for their help.

There are a few "oddball" categories where it really pays to think about this. For example, if you added smoked malt to a beer but you can't taste any smoke in it, don't enter it in the smoked beer category. Likewise, if you made a fruit beer, but the fruit flavor is MIA (which can happen in dark styles like raspberry porter or cherry stout), don't enter it in the fruit beer category.

Don't Ask, Don't Tell

In some categories you are instructed to tell the judges about any special ingredients you used. In the fruit beer category, or the spice, herb and vegetable category, for example, you are supposed to indicate which fruits, spices, herbs or vegetables are in the beer. Before simply listing everything on your recipe sheet, taste your beer and see what ingredients you can

detect and which you can't. If you made a holiday ale with cinnamon and nutmeg, but all you can taste is cinnamon, don't write "nutmeg" on your entry sheet. If the judges are expecting a dark ale with cinnamon and nutmeg and they can't taste the nutmeg, you will be "dinked" for not having nutmeg in your beer. On the other hand, if they are expecting a dark ale with just cinnamon, this same beer will score much better. Don't give the judges information that will only work against you.

Think of the Flight

When you enter your beer in a category, it will be judged alongside a flight of similar beers. If you are brewing a beer specifically for a homebrew contest, think about the likely competition when you formulate the recipe and brew the beer.

Whatever that beer category is about, your beer should show this character in spades. If you're entering the IPA category, big malt and — more importantly — big hops are the order of the day. If you're entering barleywines, your beer should be big. Fruit beers should be fruity. Smoked beers should be smoky. If the judge has to hunt to find the main attribute of a category in your beer, it will not score well.

Judges only have a few minutes with each beer. As such, the best contest beers tend to be "caricatures" of the style rather than "photographs." This doesn't mean that contest-winning beers are bad beers, just that they are often the kind of beers that stand out in a crowd. And the aspects that make them stand out sometimes come at the expense of drinkablity. (Sometimes. Not Always.)

For most categories, this means formulating your recipe so that the "main things" in that category are emphasized. Thus if you're entering a category where hop presence is a main feature of the beer style, brew the beer so it's at the top end (or even a little over the top) of the category range.

Keep in mind that the judges' palates can easy be saturated by elements of the beers being judged, and these are often the elements the category revolves around. A super hoppy beer in a lineup is going to make all the beers following it seem less hoppy. A very alcoholic beer can make the beers following it seem anemic. (Smoke is actually one of the characters that can "blow out" a judge's palate the easiest.) Brew your beer so it can stand up the "heavyweights" in its category.

Don't Attenuate Your Chances

One of the biggest problems beginning homebrewers face is having their beers finish at a specific gravity that is too high. Thus, at any large contest, your beer will likely be in a line-up with some beers that are a little sweeter and have a little more body than a properly attenuated beer. It's been my experience that properly-attenuated beers — beers whose final gravity is within a reasonable range — get

"dinged" for having too little body (or even being "watery"). This even happens for beers in categories, like dry stout, that are supposed to be well-attenuated. To combat this, brew your contest beers to have as much body as they reasonably can without being sickly sweet or inappropriately thick for the style.

Know the Definitive Beer

If you really want to do well in contests, you should know each category you enter well enough to know what the definitive type of beer in that category is. When most judges think of a dry stout, their mind flashes to Guinness. When they think of an American barleywine, they think of Sierra Nevada Bigfoot. When a category has a very definite "style defining" commercial example, it pays to emulate that beer.

Brewing towards "oddball" examples of the style — even if they fall within style guidelines — will, more often than not, lead to lower scores. For example, a dead-on clone of Schneider Weisse — a classic, but somewhat dark, example of a hefeweizen — will likely score less well than a more standard golden-colored example unless the judges really know their hefeweizens. (Sometimes they will. Sometimes they won't.)

Some categories, of course, don't have a single definitive beer — quick, what's the definitive Belgian ale? In that case, you have a bit more freedom to "wander" within the confines of the category guidelines.

Keep It Simple, Stupid

Under the current BJCP guidelines, there are a few categories where "non-beer" ingredients are added to beer. These include the fruit beers, smoke beers, wood-aged beers, spiced beers and experimental beers. As someone who brews a fair number of "out there" beers every year, I like to judge in these categories so I can see what other brewers have come up with. One thing I've noticed is that many brewers add multiple "non-beer" ingredients to their beers in these categories. Often, the ingredients don't really make much sense together or can't all be tasted in the beer.

Holiday beers are the worst offenders. Many seem to have every spice in the rack thrown into them. If you're making a beer of your own creation for one of these categories, think about whether you need all the ingredients you've planned on. Do they go well together? Will you be able to taste them all? Unless you have a good reason not to, stick to one "non-beer" ingredient in specialty beers or pairs of ingredients often found paired in foods. More isn't always better.

Judge For Yourself

One thing you can do when entering a contest is to judge your own beer for yourself. When I enter a contest, I sometimes set aside an extra bottle of

each entry to evaluate on or near the day of the contest. When doing this, I emulate how the beer is judged as much as possible. I pour out just a few ounces into a glass and sit down with a score sheet and judge the beer. If possible, I try a commercial example of the beer alongside mine and score it as well. Then, when I get the real score-sheets back, I can compare my own comments with the actual score sheet.

Judging your own beer forces you to look at your beer objectively, warts and all. When you brew and drink your own beer, you tend to take pride in that beer — and rightfully so. But it's always easy to overlook faults in your beer because you know of the times when you've done it better. You may know the reason for a fault in your beer and "forgive" yourself for it because you know you'll fix it next time. You may also know how the beer tasted a couple months ago, when it was at its peak. And, you have in your mind's eye what you were shooting for, and this mingles in with what your actual beer tastes like.

The judges, of course, know none of this. They are simply out to assign a score to your beer, which they are encountering for the first time, and they have no attachment what-so-ever to your brew. Slipping into their shoes for a few minutes will help you understand why they scored your beer how they did. And, this understanding will help you when brewing the beer again for the next contest.

Judge (or Steward) for Others

The best way to understand what judges are looking for is to judge (or steward) at a contest yourself. Most contest coordinators are happy to let a novice judge sit in at their contest. Judges have to start somewhere, after-all. You will likely be paired with an experienced judge the first few times you judge and you'll find that — although it may seem overwhelming at first — you learn the ropes quickly.

Keep Some Perspective

Finally, if your beer scores lower than you would like at a contest, remember that your beer will always taste better to you than it ever will to any judge. This is not a wishy-washy, "everyone's a winner"-type statement; it stands to reason.

You will have tasted your home-brew at the peak of its conditioning; this may or may not be the case with the judges. Your beer will likely have been stored with care at home, while your contest beer will have been shipped — and likely heated and jostled — before the judges sample it. You probably don't drink your beer in a line-up of other beers, so other examples don't dull your palate while you're drinking your own beer. And, of course, you likely brewed your beer to suit your taste buds, and everybody's taste buds are different.

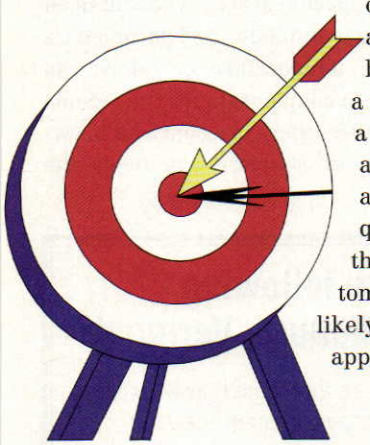
Chris Colby rarely, if ever, stands out in a line-up.

Hitting the Target

Achieve the right volume and gravity for your beer

Story by **Bill Pierce**

Among the advantages commercial brewers enjoy is their experience with a specific recipe. After brewing numerous batches of the same beer, it's a relatively simple matter to achieve the same specific gravity, bittering and color, time after time with only small variations. This results in a consistency of flavor, alcohol, body, aroma and appearance, qualities their customers are likely to appreciate.



Homebrewers often wonder how to successfully brew from recipes with which they may have no previous experience. While it may be somewhat difficult to control all of the variables simultaneously, one of the easier — and most important — values to achieve is the target original specific gravity (OG). If you follow the guidelines outlined in this article, you should be able to hit your target OG nearly every time.

Gravity and volume

The keys to hitting the target OG are to know what specific gravity and volume to achieve prior to the boil. The published OG and volume for a recipe are usually measured in the fermenter after the wort is boiled and chilled. Of course, several things occur after the runoff is collected in the kettle and before the wort reaches the fermenter. A very important value is the boiling loss. Because water is evaporated during boiling, the sugars in the wort are concentrated, increasing the specific gravity and decreasing the volume. This results in a pre-boil target gravity that is lower and a volume that is higher than the post-boil values for the recipe.

To calculate the pre-boil volume and gravity, begin by working backward from the published values. Typical homebrew recipes are often expressed in batch sizes of 5 gallons (19 L). This represents the wort that is actually collected in the fermenter and into which the yeast is pitched. To account for boiling and other losses, you will need a significantly larger volume of wort in the kettle.

Boiling losses depend on a number of variables, including kettle geometry, type of burner and vigor of the boil, air temperature, humidity and wind velocity (if brewing outdoors). However, it is possible to determine your typical losses based on experience.

For example, a recipe may be for 5 gallons (19 L) with an OG of 1.048 and a boiling time of 75 minutes (1.25 hours). If your boiling losses are 1.5 gallons (5.7 L) per hour, you will lose 1.9 gallons (7.1 L) during the boil. This would result in a pre-boil target volume of 6.9 gallons (26.1 L):

6.875 = 5 + (1.5 * 1.25)

Once you determine the target pre-boil volume, you can calculate the target pre-boil gravity. The formula is:

Pre-boil specific gravity points = (Post-boil volume * Post-boil gravity points) / Pre-boil volume

Specific gravity "points" are defined as the digits to the right of the decimal point multiplied by 1000; for example, a specific gravity of 1.048 is 48 points.

In our hypothetical recipe with a post-boil target OG of 1.048, a boiling time of 75 minutes and a pre-boil target volume of 6.9 gallons (26.1 L), the formula yields a pre-boil target gravity of 1.035:

34.78 = (5 * 48) / 6.9

A game of percentages

Achieving the pre-boil target gravity is somewhat easier for extract brewers because the extract potential (the specific gravity of a given amount of extract in a given volume of wort — another way of saying the sugar content) is usually known in advance. That is, if x pounds (or grams) of malt extract are added to y gallons (or liters) of water, the specific gravity should be z. For example, the extract potential of light dried malt extract often is given as 1.045. Therefore 5.5 lbs. (2.5 kg) of DME in 7 gallons (26.6 L) of water will yield a pre-boil target gravity of 1.035:

35.36 = (5.5 * 45) / 7.0

All-grain and partial-mash brewers need to account for the varying amount of sugars in the individual grains in the recipe, as well as the mashing technique, to arrive at what is called the "mash efficiency," that is, the percentage of the total potential sugars they actually extract from the grain into the wort prior to the boil. This will be less than 100 percent.

Grain extract potential data is available from malt producers and/or suppliers. This is the most accurate method because it varies somewhat among individual malt production lots, but brewing texts and software provide reasonably accurate averages for each type of malt.

Calculate the "total potential extract points" for your recipe by

multiplying the weight of each grain by its extract potential points, and summing the contribution of each. Then measure the actual pre-boil volume and gravity when you have collected the wort in the kettle. Multiply measured pre-boil gravity points by total volume to calculate "total actual extract points." Finally, divide the total actual extract points by total potential extract points and multiply by 100 to calculate the mash efficiency in percent.

For example, a basic recipe for 5 gallons (19 L) of pale ale with a published OG of 1.048 might consist of the following:

8.0 lbs. (4.1 kg) pale malt,
extract potential 1.039
0.5 lbs. (0.23 kg) medium crystal malt,
extract potential 1.034
0.5 lbs. (0.23 kg) dextrin malt,
extract potential 1.033

Total potential extract points:
(8 * 39) + (0.5 * 34) + (0.5 * 33) = 345.5

Actual measured pre-boil volume:
6.9 gallons (26 L)
Actual measured pre-boil specific gravity: 1.036
Total actual extract points:
6.9 * 36 = 248.4
Mash efficiency:
(248.4 / 345.5) * 100 = 71.9 percent

If there are additional fermentables added directly to the kettle (for example, malt extract, sugars or honey), consider their efficiency as 100 percent and add their contribution to the total actual extract points based on their extract potential.

After brewing several batches with the same system, you should be able to determine an average for your typical efficiency. You can use that figure as a multiplier in the previous formula to calculate the pre-boil target gravity. If you know your typical mash efficiency, for example, is 70 percent, the target pre-boil gravity for the recipe above (1.035) can be calculated as follows:

Pre-boil target gravity points = (Total potential extract points * Mash efficiency) / Pre-boil volume

35.05 = (345.5 * 0.70) / 6.9

Tools of the trade

It's important to measure the volume and gravity with reasonable accuracy. Some brewers make volume marks on the side of the kettle, while others use a previously calibrated sight glass or "dipstick." Remember to account for the thermal expansion of water as it is heated at temperatures above 39 °F (4 °C). Water and wort increase in volume approximately 2% from 68 °F (20 °C) to 158 °F (70 °C), and 4% from 68 °F (20 °C) to 212 °F (100 °C). If you use a hydrometer to measure specific gravity, you will need to cool the sample to the hydrometer's reference temperature or adjust the readings to compensate for the sample temperature (there are charts in brewing texts, or software can make the

adjustment for you). A refractometer is a handy tool for taking pre-boil gravity readings because the sample is small and cools very quickly.

Once you have measured the pre-boil volume and gravity, these figures can be compared to the target values. Of course, any number of things can occur during the mashing process that may cause you to miss the mark. Don't despair if this occurs; it happens to all brewers. The secret is to know what measures to take to correct the situation and adjust the gravity or volume accordingly so that you still achieve the target values.

Within reason, the target gravity is more important than the target volume. A little extra volume is desirable in order to allow for various losses after the boil. There are several possible means of adjusting the values, depending on whether the actual volume and gravity are above or below the targets. Diluting the wort with water will increase the volume and decrease the gravity, both before and after the boil. Adding fermentables will increase the gravity. Lengthening the boiling time will decrease the post-boil volume and increase the post-boil gravity, while shortening the boiling time will have the opposite effect.

The right formula for the right job

Let's examine each of these situations individually and determine the appropriate formulas and measures to make the adjustments.

If the pre-boil gravity is higher than the target, you can dilute the wort by the addition of water. This is especially useful when this is true and the volume is below the target. The amount of water can be determined by the mixing formula Aa + Bb = Cc, where the upper case value is the volume and the lower case value is the specific gravity.

Volume of addition = (Volume before dilution * (Actual gravity points - Target gravity points)) / Target gravity points

For example, if the target pre-boil volume is 6.9 gallons (26.1 L) and the target pre-boil gravity is 1.035, but the actual measurements are 6.8 gallons (25.7 L) and 1.037, dilute with 0.39 gallons (50 oz. or 1.48 L) of water:
0.39 = (6.8 * (37 - 35)) / 35

This will result in a new total pre-boil volume of 7.3 gallons (28 L), and a post-boil volume of 5.4 gallons (20.5 L) if the boiling time is 75 minutes and boiling losses are 1.5 gallons (5.7 L) per hour:
7.3 = 6.9 + 0.39
5.4 = 7.3 - (1.5 * 1.25)

If the pre-boil gravity is lower than the target but the volume is close to it, sometimes the best course of action is to add fermentables to increase the gravity. This can be in the form of malt extract, honey or other sugars. Adding

honey or sugar rather than malt extract will decrease the body slightly because these are somewhat more fermentable.

The formula for the addition of fermentables is a combination of the prior mixing formula with the formula for calculating extract points based on the weight and extract potential:

Weight of addition = (Volume of wort * (Target gravity points - Actual gravity points)) / Extract potential points of addition

For example, let's say the target pre-boil volume is 6.9 gallons (26.1 L) and the target pre-boil gravity is 1.035. The actual pre-boil volume is also 6.9 gallons (26.1 L), but the actual pre-boil gravity is 1.032. Adding 0.46 pounds (7.4 oz. by weight or 209 grams) of light dried malt extract (extract potential 1.045) will increase the gravity to hit the target:
0.46 = (6.9 * (35 - 32)) / 45

Dried malt extract has little if any effect on the volume, while liquid malt extract increases the volume slightly because it is typically about 20 percent water.

Adjusting the boiling time affects both the post-boil gravity and the post-boil volume. This also has some effect on beer color and flavor, but these are minor if the time difference is small. Increasing the boiling time might be appropriate for higher gravity beers, while decreasing it might be desirable for lighter colored styles. Increasing the boiling time is less useful if the actual pre-boil gravity is more than a few points below the target. In that case you would do better by adding fermentables.

The formula for the effect of changing the boiling time on the gravity is:

Increase (or decrease) in boiling time in minutes = (Pre-boil volume * (Target pre-boil gravity points - Actual pre-boil gravity points) * 60) / (Target pre-boil gravity points * Boiling losses per hour)

For example, our hypothetical recipe has a pre-boil target volume of 6.9 gallons (26.1 L) and a pre-boil target gravity of 1.035. If the actual pre-boil volume is 7.0 gallons (26.5 L), the actual pre-boil gravity is 1.033 and boiling losses are 1.5 gallons (5.7 L) per hour, increasing the boiling time by 16 minutes will achieve the post-boil target gravity (OG) of 1.048).
16 = (7.0 * (35 - 33) * 60) / (35 * 1.5)

Thus, if the boiling time specified in the recipe is 75 minutes, the new boiling time is 91 minutes (75 + 16).

In the opposite instance for the same recipe, if the actual pre-boil volume is 6.7 gallons (25.4 L), the actual pre-boil gravity is 1.036 and the boiling losses are 1.5 gallons (5.7 L) per hour, reducing the boiling time by 8 minutes will achieve the post-boil target OG:
-7.66 = (6.7 * (35 - 36) * 60) / (35 * 1.5)

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BREWER'S log

Whiskey Profile Kit
Still Spirits

Still Spirits has developed The Whisky Profile Kit in response to those who want a more personal touch on their home crafted spirits. The kit provides all the flavor notes that make up a whisky and allows the home beverage crafter to adjust the profile to their own taste; flavors like peat, oak, sherry, grain and fruity esters to name a few. Also included in the kit are measuring utensils for accurate dosing and a recipe booklet. Still Spirits' home market is New Zealand where distilling at home is legal. Because it is not currently legal in the US or Canada, these flavors will blend equally well in a base of commercially produced and purchased vodka. Visit StillSpirits.com for more details.

Forbis' Original Corn Sugar Primer Forbis Homebrew

Forbis Homebrew has released a pre-mixed and pre-measured corn sugar primer. The 4-fluid ounce bottle of brewers' dextrose has been pre-boiled for you. Priming your bottles or keg is as simple as pouring the bottle into your typical 5-gallon (19-L) batch. For more information visit www.forbishomebrew.com.

Advanced Brewing

continued from page 56

In this case, the new boiling time is 67 minutes (75 - 8).

For the effect of the change in boiling time on post-boil volume, the formula is:

Decrease (or increase) in volume = Increase (or decrease) in boiling time in minutes * (Boiling losses per hour / 60)

In the first example above, the corresponding decrease in the post-boil volume is 0.4 gallons (1.5 L), and the new total post-boil volume is 4.7 gallons (17.9 L):
0.4 = 16 * (1.5 / 60)
4.72 = 7.0 - (1.5 * 1.52)

In the example above with the boiling time reduced by 8 minutes, the increase in the post-boil volume is 0.19 gallons (2725 mL), and new total post-boil volume is 5.0 gallons (19 L).
0.19 = 7.66 * (1.5 / 60)
5.02 = 6.7 - (1.5 * 1.12)

It is also possible to adjust the volume and gravity in the fermenter after boiling. Despite the potential effect on body, it is often preferable to add sugar to increase the gravity post-boil rather than malt extract, which generally should be boiled for at least 10 minutes to coagulate proteins that can lead to haze in the beer.

Using these guidelines and with a little practice (and assuming no major brewing mishaps), there is no reason you shouldn't consistently come within 1 specific gravity point (0.001) of your target OG for every batch you brew. This will go a long way toward improving the consistency of your beers and your ability to successfully brew a wide variety of recipes.

One final note: the equations based on specific gravity are technically only approximations. To rigorously calculate these values, you need to use iterative calculations involving specific gravity and degrees Plato. However, these approximations work well on a homebrew scale and are easy to use.

Bill Pierce writes the "Advanced Homebrewing" column in every issue of Brew Your Own.

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The Daddy Mash

A good father neglects neither beer nor kids

by Alex Northrop • Middlebury, Virginia

When I started brewing in 2001, I had a 1-year-old daughter. Three years and many batches of beer later, I have a 1-year-old daughter and a 4-year-old daughter. For a long time, finding a spare moment to brew was hard. And fitting in an all-grain brew session between changing diapers and wiping runny noses just wasn't possible. When I told my local homebrew supply guy that I had decided to go all-grain, he looked down at the munchkin holding my hand and said, "Most guys with little kids stick to extract brewing."

Alex finds time to bond with his kids during the first segment of the Daddy Mash pouring grains.

I took his words as a challenge. Could I find a way to brew a decent batch of all-grain beer that didn't involve either staying up all night or neglecting my familial duties? Well, over the last year, I have refined a brewing schedule I call "The Daddy Mash." Basically, the Daddy Mash divides the brew day up into three parts: preparation for the mash, the mash and everything else. Because the first two steps can be made family friendly, only during the last stage do I really need alone time. With flexibility and a little streamlining, I can schedule part three for a time when dad's services are not required by mom or the kids and still get enough sleep to be fresh as a daisy for the 6:00 a.m. diaper duty.

Let me tell you how the Daddy Mash works. The mash takes place on a weekend day, usually Sunday for me. You can take care of family business until around 4:00 p.m., then it is time to mill the grain. Including the kids whenever possible is an important component of the Daddy Mash. My girls love to help out with the beginning of the brew day. My 4-year-old helps me carry the grain out to our deck, carefully weighs it out, dumps it in the mill, and turns the crank! Meanwhile, my 1-year-old likes to pound on the side of the grain bucket. The kids are having fun, Mom gets some free time and Dad's brewing is off to a good start. So far so good!

An hour later, I start to heat the mash water and I try to mash-in between 5:30 and 6 o'clock. I do a single-infusion mash, usually around 150 °F (66 °C). The next step is crucial to the Daddy Mash. Once I hit my target temperature, I close the lid on my mash tun and walk away with a smile on my face. I know it will take at least two hours to perform Dad's end-of-the-day routine – dinner, bath and bedtime for the kids. But I do not stress about rushing back to start the sparge at any particular time. After 90 minutes, the starch conversion will be pretty much complete. As long as the temperature remains constant, those beautiful sugars will be waiting for me, whenever I finish up my Dad duties.

So with the kids tucked safely into bed, hopefully by 8:00 p.m., I switch from Dad to Brewmaster. My goal is to sparge, boil, cool, pitch and be in bed before 11:00 p.m. In order to make that happen, I had to accept some trade-offs. I reduced my batch size from five gallons to three gallons. I brew on an electric stove, and the smaller amount of water made a surprisingly big difference in the time it took to heat mash and sparge water and to bring the wort to boil. In addition, it takes less time to cool three gallons down to a pitchable temperature.

Sometimes it takes six hands to put that special touch on your homebrew. Lucky for Alex, he has willing help.

I also began batch sparging, which cut a few more minutes off of the brew day. After a 60-minute boil, I have usually cooled, pitched the yeast and cleaned up by around 10:30 p.m. Mission accomplished!

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FE600 - $49

FE610 - $89

KEG400 - $180

Keep a Keg Cold for 4 Hours With No Ice!
KEG437 - $30

Slip in Some Ice Packs Before Work...
FE333 - $43

Insulated With Cap
No Spilling!
BAR540 - $10

Mini-Regulator
VERY COOL
KEG960 - $135

Cooled Conical Fermenters

No fridge space? No probelm! MoreBeer cooled conicals are the ultimate solution. Ferment your beer up to 30 degrees below ambient temperatures with our powerful, space-saving fermenters.

Manufactured by MoreBeer!

Cooled Conical - CON500
(7.1 Gallons)

Cooled Conical - CON530
(12.2 Gallons)

Cooled Conical - CON660
(24.4 Gallons)

Signature Series Kits

A One-of-a-kind line-up of kits designed by some of our very best customers. Off the beaten path and full of flavor!

The Original:
The Frank Ellis Kit

Jamil's Chocolate Hazelnut Porter

Jim Rossi's Honey Pale Ale

Jason Breatt's Honey Stout

John Palmer's
Klangfreudenfestbier

Jim Nielson's HopMothra

Beer Beer & more Beer™

Since 1995

Absolutely Everything! for Homebrewing & Beer Dispensing!

- Starter Kits
- All-Grain Systems
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- Brewing Sculptures
- Great selection of hops
- Glassware/Barware
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- Huge website
- Knowledgable staff
- Giant Book Selection
- White Labs Yeast
- Huge grain choices
- Oxygen Systems
- European Faucets
- Yeast Testing Kits
- Bi-Metal Thermometers
- pH Meters
- Tons of Scales
- RO Water Systems
- Beer Filtering Units
- Stainless Conicals
- Grain Mills
- Quality Wort Chillers
- Yeast Culturing
- Refractometers
- Bottles/Fillers
- Custom-Made Extracts
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- Stainless Ball Locks
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- Much, Much More...

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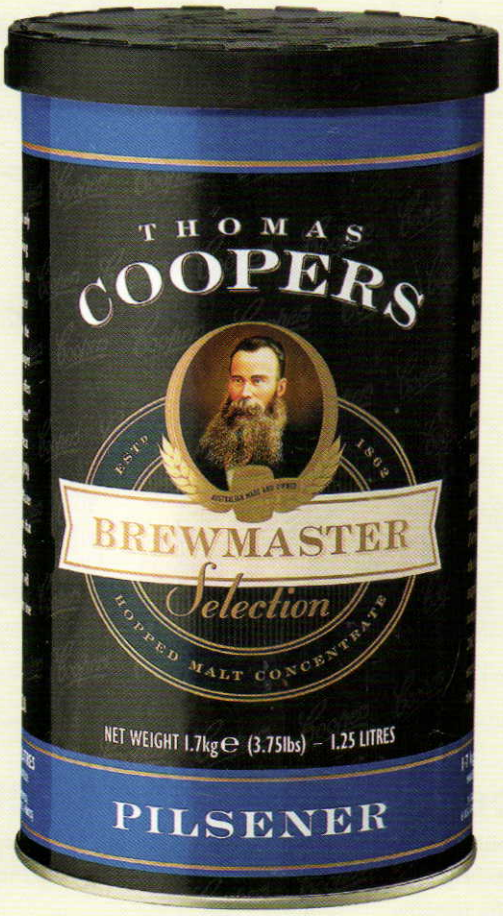
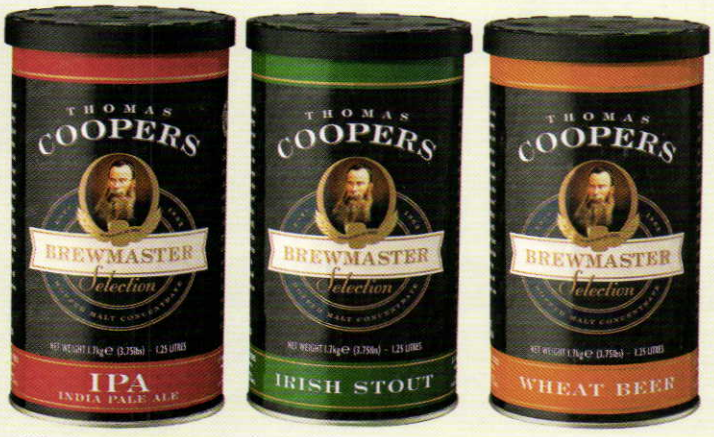
FAST, EASY, SIMPLY THE BEST.

A true Pilsener with a bold, spicy Saaz hop aroma!



Shrimp on the Barbi, A Coopers Pilsener in Hand!
Summertime, Indeed!



Also available in IPA, Irish Stout & Wheat Beer. Each Brewmaster Selection Kit is packaged with stylistically appropriate yeast.

Visit us at www.cascadiabrew.com for some of our favorite summer grilling recipes, including a shrimp, Cajun sausage, artichoke shishkabob that makes us think we've died and gone to the Coopers Brewery!

Coopers

www.cascadiabrew.com