

Brew

NOVEMBER 1999, VOL.5, NO.11

YOUR OWN[®]

THE HOW-TO  IN BEER MAGAZINE

Spicy **Winter Warmers**

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Right Hops**

**66 Varieties!
Hops Flavor Chart**

**Easy Partial
Mashing**

**Styles: Porter,
Belgian Frambozenbier**

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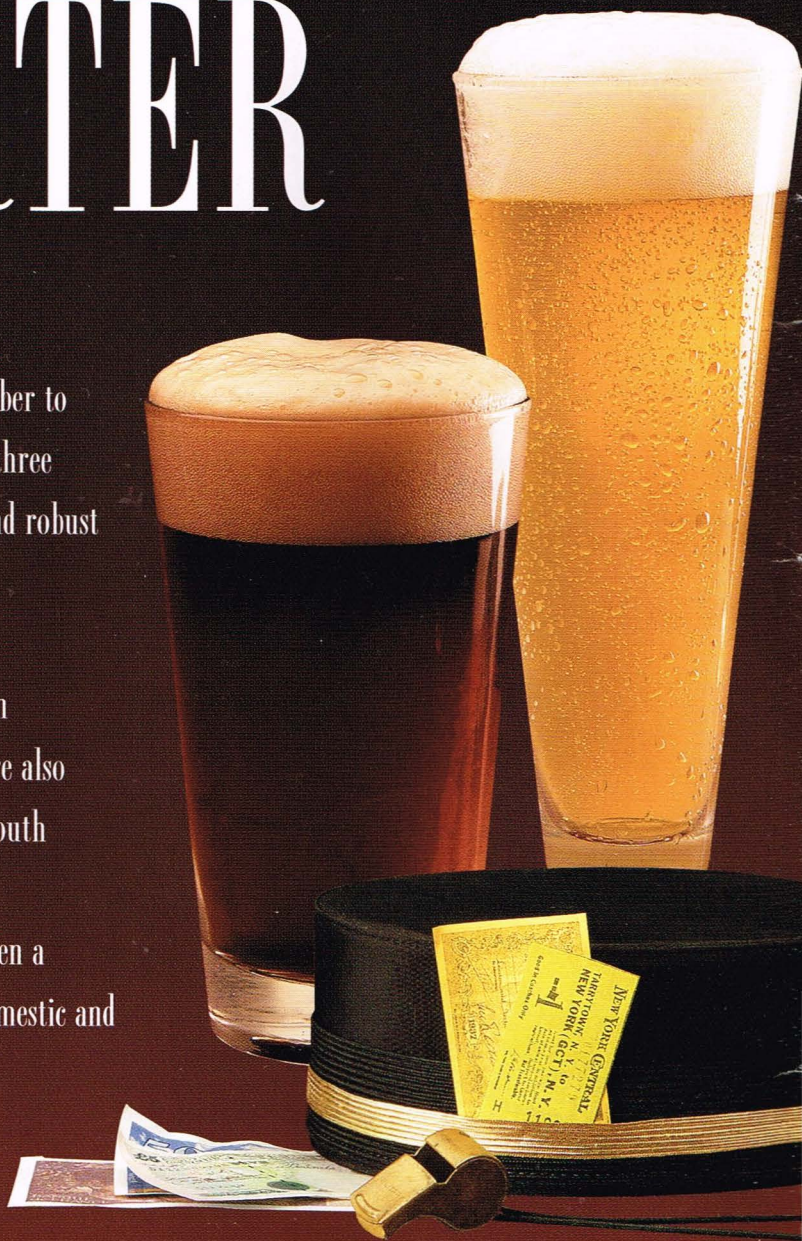
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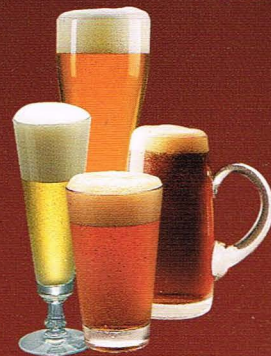
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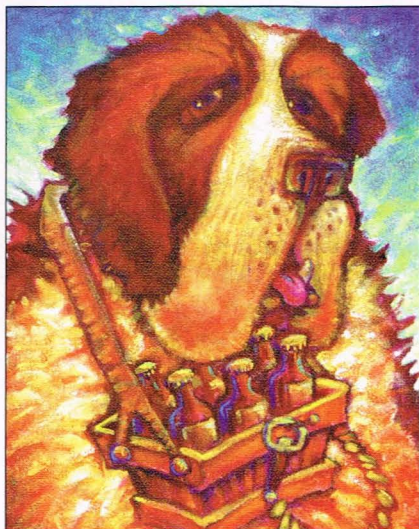


Contents

NOVEMBER 1999

FEATURES

- 20 Take Control with Partial Mashing** *Sal Emma*
Don't have time for a full mash? Partial mashing gives you the flexibility and benefits of mashing with the convenience of extract brewing.
- 28 Take Heart with Winter Warmers** *John Oliver*
These seasonal beers were traditionally served to warm the body and soul with their herbs, spices, and high alcohol content. Recipes included for spruce beer, wassail, and a brew to fight off Old Man Winter.
- 34 Find a Carboy and Fill It!** *Todd Frye*
Racking is a key step in achieving good beer clarity and flavor. Learn basic and advanced siphon techniques for transferring your homebrew.
- 36 Choosing Hops** *Larry Lesterud*
There's something special about an ingredient that can make a beer bitter and give it a delicate aroma, too. Get the lowdown on hops pedigrees, their defining characteristics, and how to tell if they're fresh.
- 41 Comparing and Selecting Hops**
A great reference! This chart lists 66 flavor and aroma hops, their alpha acid level, which beer styles to use them in, and hop substitutions.
- 47 Growing Hops: Planting Healthy Vines** *Scott R. Russell*
It's never too early to prepare your soil for growing healthy hops. Tips for planting new hop rhizomes and re-energizing existing vines.
-



p. 28

DEPARTMENTS

- 2 Editor's Note**
The plot thickens.
- 3 Mail**
Mice advice, milling hemp seeds, and topping up carboys.
- 5 Pot Shots**
Strange and unusual brewpots.
- 56 Last Call**
Brewing into thin air.
- 52 Homebrew Directory**
- 55 Classifieds**
- 50 Advertiser Index**

COLUMNS

- 7 Recipe Exchange**
Effects of French literature on brewing.
- 9 Help Me, Mr. Wizard**
The Sultan of Sparging advises on grain-bed temperature.
- 13 Style of the Month**
Porter and frambozenbier for fall.
- 49 Winemaking**
Making old-time country wines.

The Plot Thickens

In case you hadn't noticed, things have gotten bad in Hollywood. Really bad. Profits might be up, but creativity is running dry. Simply put, they are running out of new ideas for movies and TV shows.

Think about some hits from the past few years. "Forrest Gump" was about a simpleton with no personality, and it won an Oscar! "Seinfeld" was the self-proclaimed show about nothing, and it was the highest-rated show for years. "Toy Story" explored the deep emotional lives of molded-plastic action figures. Two studios recently traded barbs over who had the best movie about ant colonies. What's next, "Cockroachz"?

And I recently read that there's a battle raging over who will be the first to put out a remake of "The Partridge Family." As far as I'm concerned, once they made the "Car 54, Where Are You?" movie, all the old shows had been done.

Topics have been tapped, from Ants to Aliens. But nobody has ever done a show about a brewer. I know, Drew Carey homebrewed on an episode. Tom Cruise had a beer at Boscos Pizza Kitchen & Brewery in "The Firm." And I once saw some British thing on A&E where people kept getting killed over who was going to inherit the family brewery. But that's not much. So how about these:

"Mad About Brew." This show features the world's cutest couple and their dog. The couple hug and kiss a lot until the husband does something dumb, like put in too much hops. They disagree about whether the beer should be hoppy or malty. They argue, using about 7,000 puns on the words bitter and sweet. Then they complain, separately, to their friends. In the end they kiss and make up and agree to split the batch next time.

"NYPD Brew." Detectives Sip-owicz, Beertinez, and the gang investigate a homicide at the local strip club. Someone has bludgeoned the bouncer to death with a stainless steel brewing spoon. His 10-gallon brewpot with the spigot and ball valve and fully converted kegging system are missing from his apartment. Sip-owicz gets a tip: Way Cheap Brew Stuff, Check Cashing, and Pawn Shop has been selling primo brewing equipment below cost. In the end he gets a signed confession, and another criminal is sent up the river.

"beER." A prison bus crashes into a brewery, and a news helicopter crashes on top of that. Can the crack emergency staff keep up? Meanwhile, the nice pediatrician has been homebrewing on the side with someone he shouldn't. At least that's what the nurse who's carrying his baby thinks. But it doesn't matter — he'll be off the show soon.

Okay, so maybe I don't have a future as a script writer. But I know you'll enjoy this month's cover feature on winter warmers. Regular contributor John Oliver, head brewer at BJ's Brewery in Brea, Calif., gives tips on making winter beers and offers his favorite recipes. They'll keep you toasty during the cold weather, even when you watch those same old shows with the same old non-brewing plots.

The story, "Take Heart With Winter Warmers," begins on page 28. Check it out.

Craig Bystrynski

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Mice Advice

Dear BYO,

I just read Mr. Wizard's answer to the fellow who wanted to know how to store grain (September '99 BYO). In addition to your good advice, you should probably add that if there are any mice around, they will be drawn to stored malt like little malt-homing missiles.

I had about 10 pounds of grain stored double-bagged in heavy plastic, but the mice found it anyway. What they can't eat on the spot they carry away to store in odd corners. So not only do you lose the grain, but you have to keep cleaning up little caches of malt for months. Even heavy plastic containers aren't enough. I've had mice chew halfway through the lid of one to get at my malt. Now I store it in a heavy wooden cabinet with tight doors. If this sort of thing isn't available, metal cans work, too.

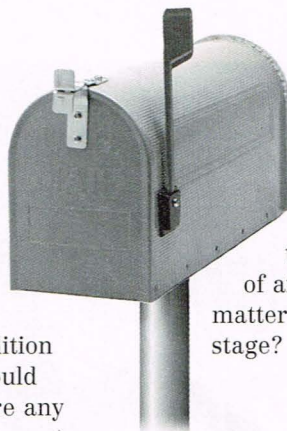
Arne Thormodsen
Corvallis, Ore.

Mice will indeed find malt if they can and chew through just about any type of storage container. The key to hiding malt from mice is to keep the floor around the malt clean and to store the malt off of the ground. These two precautions will usually keep mice away from your malt.

Topping Up

Dear BYO,

A reader asked a question about topping up his carboy when transferring to secondary (Mr. Wizard, August '99 BYO). He asked if he needed to do this, and Mr. Wizard said: "This is one homebrewing practice I have never come across." Some homebrewers say you should do this to eliminate as much air in the carboy as possible, not necessarily to get more beer out of the batch. I boil water then cool it down and add to the secondary, to about an inch below the neck of the



carboy. I usually only need to add a cup or two. Does that extra little bit of air in the carboy not matter in the secondary stage?

Tim Daviess
Indianapolis

The little bit of air in the secondary fermenter doesn't matter much because the beer is still fermenting and the small headspace of air is quickly displaced by carbon dioxide formed from the secondary fermentation.

The practice of topping up might come from winemaking. Wooden barrels lose wine to evaporation over time, and wine-makers periodically top them up with more wine. This reduces the chances of having wine turn to vinegar from the growth of acetic acid bacteria that thrive in aerobic (oxygen containing) environments.

Brewers need not worry about these bugs because the headspace of a carboy contains little to no oxygen and the airlock prevents any air from entering the carboy. If wooden casks are used for beer, then topping up makes sense.

Brewing Hempen Ale

Dear BYO,

BYO's Web site (www.byo.com) was the first site I looked up when I got connected to the Internet. Happy to finally figure out the Web, tonight I celebrated by opening my first homebrewed bottle of hempen ale ("Brewing Hempen Ale," July '99 BYO). It is tasting great after only one week in the bottle.

One question: Should the hemp seed be crushed before I put it into the mash? I just threw the seed in.

Bryan Bell
Lincoln, Neb.

According to Steve Nordahl, the creator of Hempen Ale, the hemp seed should be milled with the rest of the grist.

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Strange and Unusual Brewpots

Gerald H. Bohr
Jefferson City, Mo.

My saintly wife, Stephanie, has allowed me to assemble my "second-generation" (okay, salvage yard) all-grain brewing system while keeping our vows of 23 years intact. The system consists of two 20-gallon, steam-jacketed, stainless steel vessels fired by a three-gallon canning pressure cooker (thanks, Mom!). The vessels were purchased at a salvage sale, and the next question was how to get steam into them.

After countless trips to the library and sleepless nights, the basic concept was born. I asked some friends (Rik the plumber and Lanny the pipefitter) for help shedding light on the subject. After obtaining manuals from the manufacturer, the proper valving and pressure-relief mechanisms were in place.

A steam manifold and condensation-return were built (although not to code, I should add; this system was not professionally



My quest for the perfect system paid off.

designed, so don't try it at home). I can't even begin to tell you how many trips to hardware and plumbing supply stores were involved, but let's just say I was on a quest.

Finally, it was brew day! The vats were properly filled with mash-in and sparge water, and I had sweaty palms. The time had come to test my brewing system. The flame contacted the new, untried steam

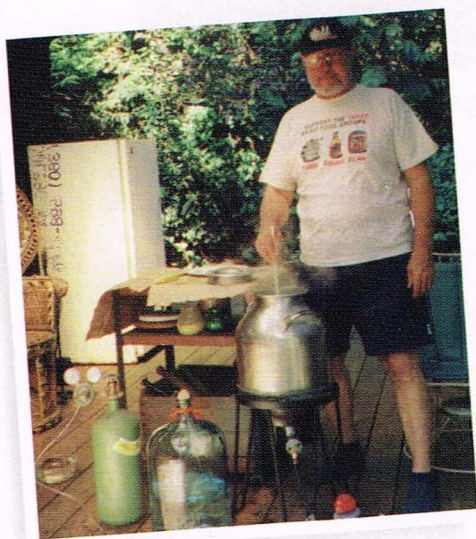
system and my eyes were fixed on the PSI gauge. The mash tun got warmer and I smelled Abbey Ale in the making. It was working!

Of all the brewing sessions I have had before and after that day, none was as exciting or as enjoyable. This is what homebrewing is all about. Now my system is like an old friend; I know what to expect from it and the brews are a joy to make and drink.

James L. Nichols
Poulsbo, Wash.

Strange as it may seem, this old brewing pot is still the cream of the pots. I have been brewing extract for about two years and am ready to go all-grain. The old creamery pot might get retired, but it will always be at hand.

The old creamery pot paved the way for all-grain brewing.



STRANGE BREW?

Do you have a unique or weird name for your homebrew? Did you have a bizarre brewing experience that resulted in a peculiar beer title? Tell us the name of your strange brew and the story behind it. If we publish your response, we'll send you a cool BYO T-shirt. Send your story and photo to Pot Shots, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at erika@byo.com. Be sure to include your mailing address!

James Grob
Centertown, Mo.

I spotted what is now my brewpot in a hillbilly's yard, which looked to be unworthy (for the brewpot). After bartering with this old guy, I obtained my brewpot for the staggering fee of \$10 and two bottles of homebrew (he could spot a good deal)! After a little welding (\$70), this old grease filterpot was ready to brew. It's perfect for a 10-gallon batch. I have enjoyed building and scrounging my equipment. Somehow, it just makes my brewing more fun!



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Effects of French Literature on Brewing

by Scott R. Russell

I have an alter ego, a secret identity, in short a day job. I'm a high-school French teacher. Pretty mundane, sometimes, but that's one of the reasons I make my own beer. It's also one of the reasons I am able to make my own beer — time. A teacher's schedule is wonderful.

I have had time to read some wonderful French literature, too. One book I enjoyed was Marcel Proust's *A La Recherche du Temps Perdu* (Remembrance of Things Past).

What does this have to do with homebrewing? Not much. Except that one of the few things that many people know about Proust's multi-volume opus is the scene where he explains how a taste or an odor can trigger memories of events, people, and scenes. He's eating a madeleine (a bland French cookie), and it launches him into narrating his coming of age, his life in society,

his loves, and his losses.

The same thing happens to me with beer. Certain beers are associated in my mind with certain periods of my life, with people, with places. Other tastes and aromas, outside of beer, work as well, of course, but they don't fit as neatly into a column about homebrewing. Except this one: rosemary.

My wife and I have tried several times to grow rosemary. We buy a healthy young plant and plop it in the ground. It grows all summer, triples in size, but then dies back to nothing and never comes back the next spring. Every year we say that we'll mulch it differently and take better care of it, but every year we have to buy a new one. We've also tried to keep it inside, but our house is either too humid or too dry. We're not sure which. The thing is, the

smell (and taste) of rosemary is one of

those amazing memory joggers for me. The stuff grows wild in Mediterranean climates. In Provence, in the south of France, it grows taller than people. Every time I smell rosemary or eat something cooked with it, I am transported to a hillside overlooking the Riviera.

I wondered if it would work as an adjunct in brewing. It's not too far removed from spruce and pine aromas (which are sometimes used in beer). So I bought another rosemary plant, grew it all summer, and then cut it and dried it and brewed a rich amber ale to celebrate the harvest. I used my dried, home-grown rosemary as a flavoring hop and then dry hopped with it in the secondary to boost the aroma.

And the rest is (literary) history.



Rosemary IPA (5 gallons, partial mash)

Ingredients:

- 4 lbs. pale malt
- 0.5 lb. toasted pale malt (toast on a cookie sheet for 15 min. at 350° F)
- 0.5 lb. medium crystal malt, 50° to 60° Lovibond
- 4 lbs. unhopped light dry malt extract
- 0.5 oz. Chinook hops (12% alpha acid, 6 AAUs) for 90 min.
- 1 oz. Willamette hops (4% alpha acid, 4 AAUs) for 90 min.
- 1 oz. Goldings hops (4% alpha acid, 4 AAUs) for 15 min.
- 2 oz. dried rosemary leaves: 1.5 oz. for 60 min., 0.5 oz. for dry hop
- English ale yeast slurry (Wyeast 1098 or equivalent)
- 1 cup unhopped light dry malt extract for priming

Step by Step:

Heat 2 gal. water to 162° F, crush the grains and add to water in your mash tun. Hold at 150° F for 90 min. Sparge with 2.5 gal. of 170° F water.

Stir in light DME, bring to a boil. Total boil is 90 min. Add Chinook and Willamette hops and boil 30 min. Add 1.5 oz. rosemary and boil 45 min. Add the Goldings hops, boil 15 min., then remove from heat. Cool and top up to 5.25 gal. with chilled, pre-boiled water. Pitch yeast at 68° to 70° F.

Ferment warm (65° to 70° F) for eight to 10 days. Rack to secondary and add the 0.5 oz. rosemary. Condition cooler (50° F) for two to three weeks, then return to warm place for a week. Remove rosemary, prime with

dry malt extract, bottle, and condition at 50° F for three to four weeks.

OG = 1.062

FG = 1.015

Bitterness = 52 IBUs

Notes:

Extract: Omit the pale malt. Steep the toasted malt and the crystal malt, as above, in 2.5 gal. of 150° F water for 30 min. Remove grains and bring to a boil. Increase the DME to 6.5 lbs., proceed with the boil as above.

All-grain: Omit the DME. Mash 10 lbs. pale malt, along with the toasted malt and crystal malt as above, in 3.5 gal. water. Sparge with 4 gal. of water. Proceed with boil as above, timing it to evaporate down to 5.25 gal.

Reader Recipe

Pumpkin Pale Ale

(5.5 gallons, extract with grain and spices)

This beer matures nicely in one year, so brew it soon and it will be perfect by next Thanksgiving. This beer has been received quite favorably in homebrew contests, receiving its share of first-place ribbons.

*George O. Proper
Albany, Calif.*

Ingredients:

- 0.5 lb. two-row pale malt
- 0.5 lb. malted wheat
- 0.5 lb. crystal malt, 40° Lovibond
- 10 lbs. baked pumpkin
- 6 lbs. British amber liquid malt extract
- 1 cup light brown sugar
- 1 cup unsulfured molasses
- 0.5 oz. stick cinnamon
- 0.5 oz. ground whole all-spice (fresh)
- 0.1 oz. whole cloves
- 0.1 oz. sliced fresh ginger

- 0.5 oz. ground whole nutmeg (fresh)
- 1 tsp. pumpkin pie spice
- 1 oz. Mt. Hood hops (4% alpha acid, 4 AAUs) for 60 min.
- 1 oz. Hallertauer hops (4% alpha acid, 4 AAUs) for 30 min.
- 1.5 oz. Fuggle hops (4% alpha acid, 6 AAUs): 1 oz. (4 AAUs) for 30 min, 0.5 oz. (2 AAUs) for 10 min.
- Wyeast 1056 (American ale)
- 1 cup priming sugar

Step by Step:

Clean medium-size pumpkin and remove seeds. Halve or quarter pumpkin and bake on a baking sheet for about 60 min. at 450° F or until tender (mushy). Mash with a potato masher, removing meat from the skin. Put pumpkin and grains in a kettle along with 1.5 gal. hot (120° to 130° F) water. Raise temperature to 150° F and steep for 60 min.

Sparge with enough hot (170° F) water to collect 3 gal. of liquid

(extracting the pumpkin flavor from the mashed pumpkin), and add extract, brown sugar, and molasses.

Total boil is 70 min. Bring liquid to a boil and boil for 10 min. Add Mt. Hood hops and boil 30 min. Add 1 oz. Hallertauer hops and 1 oz. Fuggle hops and boil for 20 min. Add 0.5 oz. Fuggles and boil for 10 min. more. Turn off heat. Add spices and steep for 10 min. Strain into primary fermenter. Sparge with enough hot water to make 5.5 gal. Chill to 70° F and pitch yeast.

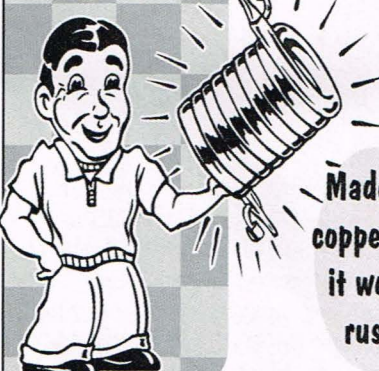
Ferment at 70° F three to five days until fermentation subsides. Transfer to secondary and ferment for another three weeks. Prime and bottle at four weeks. Keep until next Thanksgiving, if you can. Warning: If you begin sharing this batch before Thanksgiving, you'll be in danger of running out before Turkey Day arrives.

OG = 1.055

FG = 1.015

Bitterness = 38-40 IBUs ■

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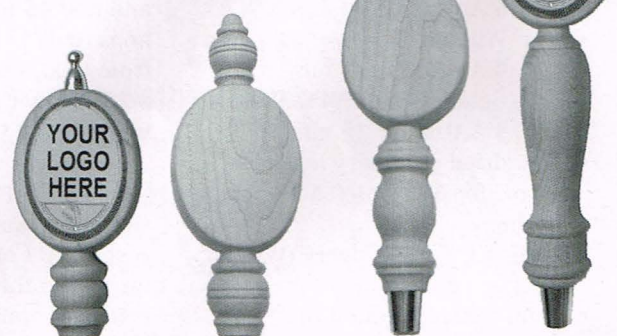
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Hot About Heat Loss

Mr. Wizard

Now that I've done about a half-dozen batches of all-grain brew, with a variety of results, I have a question about water temperature during the sparging process: What does the actual temperature of the grain bed itself need to be, and how does varying it affect the beer? I have seen recipes say to sparge with 170° F water, but after that water runs through a sparging arm and sprinkles onto the mash, it has cooled significantly, sometimes as much as 30° F. Other people have told me they just use boiling water for sparging, but I am concerned with leaching the tannins from the grain husks if the water is too hot. Is there a guideline to go by? I am using a plastic hose from the hot liquor tank to a rotating sparging arm. Are there recommended devices to use that allow a more predictable grain-bed temperature?

Jeff Hubbard
Reno, Nev.



In practice you can have a cooler grain-bed temperature and make great beer. The compromise with a lower temperature is lower yield on the malt. Commercial brewers usually avoid this option, but homebrewing is not about shaving malt cost by 1 percent or 2 percent, and a slightly lower grain-bed temperature is a cheap solution for ensuring that these flavor compounds are not a problem.

Although sparging is easy enough to scale down, there are some problems that pop up. One difficulty is heat loss — small-diameter hoses lose much more heat to the environment than large-diameter stainless steel pipes.

This is one reason your sparge water is cooling off between your hot liquor tank and the sparge arm. Another problem is heat loss from the top of your lautertun. Again, most com-

mercial lautertuns lose much less heat from the top because lautertuns have large "heads" (industry lingo for tops and bottoms of tanks) and are typically either preheated or hot from the previous brew.

Every brewer has different things that bug them; it sounds like this issue is one that bugs you. I have three recommendations to help ease your mind:

1. Heat your mash to 168° to 172° F before transferring to your lautertun. If this is not possible because you use an infusion mash/lauter setup, add boiling water to your mash while stirring to

raise its temperature.

2. Compensate for heat loss by increasing the temperature of your hot liquor tank. Don't worry too much about extracting tannins — think of sparging as taking a shower. The naked guy in the shower could care less about the temperature of the hot water tank; it's the temperature of the water coming out of the shower head that counts. You've estimated your heat loss at 30° F, which would put your hot liquor tank at roughly 200° F. Make sure your hoses and sparge arm can withstand this higher temperature.

3. Instead of idea number 2, consider using batch sparging instead of a sparge arm to reduce heat loss. Batch sparging is the practice of adding three or four additions of sparge water to the lautertun instead of a continuous flow. This method is used by many commercial brewers and works very well. The key is to avoid letting the top of the grain bed get dry. In any case, batch sparging will significantly cut down on your heat-loss problem. And you don't have to worry about overheating the grain bed because you can assume minor heat loss, less than 10° F.

Mr. Wizard

I recently went into a local supermarket and saw bottles of "super-oxygenated water" sold by the Clearly Canadian company. It claims that this water is treated to have 10 times the oxygen content of "regular" water. Do you think adding a gallon, or even a half-gallon, of this water to a batch that does not undergo a full wort boil will aid in reducing fermentation lag time? I know you should probably pre-boil the added water, but I think that might take out the oxygen and defeat the whole purpose. I personally always

Like many practices used by homebrewers, sparging techniques are typically scaled-down versions of what goes on in a commercial brewery. The basic idea is to use water hot enough to extract all of the desired compounds (mainly malt sugars) from the grain bed while leaving the undesirable stuff, such as polyphenols and starch.

The standard method for commercial brewing is to heat the mash to between 168° and 172° F (mash-off) before transferring to the lautertun, where water of the same temperature is used for sparging. Most brewers fear flavor problems will develop if the overall temperature of the grain bed exceeds this range.

do a full-wort boil, but I thought it would be a good bit of information for anyone who only boils part of their batches.

*Patrick Bigatel
via e-mail*

This sounds like an interesting idea. For this method to work the wort must be cooled before the super-oxygenated water is added and the super-oxygenated water can't be boiled. The reason behind this is that heating the water directly or indirectly by adding it to hot wort would reduce the oxygen content. My guess is that the super-oxygenated water is made using ozonation (adding ozone) and in the process the water is sanitized.

I also have heard of people adding hydrogen peroxide to wort for the same purpose. Although hydrogen peroxide decomposes into water and oxygen, it also is a potent oxidizer and might affect beer

flavor. I've never tried using hydrogen peroxide to oxygenate wort, but adding oxygenated water seems like a safer experiment.

I did some research on the Internet to find out more about this intriguing product. I'm not a physiologist, but I can't imagine that drinking super-oxygenated water does much more for your body than regular water. After all, it's our lungs that do most of the oxygen absorption. As I suspected, "super-oxygenated water" is a marketing ploy. It is described by the president of Clearly Canadian as a brand "that delivers a unique drink experience in a bold and exciting package" and comes in a nifty bottle inspired by oxygen tanks. Cool stuff! I didn't find any health claims or any mention that the super-oxygenated water is anything more than a refreshing drink. Your idea to use this water to oxygenate wort might be one of the more useful applications of this product.

The article "Four Sanitizing Solutions" (February '99 BYO) discussed how to sanitize equipment using heat, iodophor, bleach, and Star San. I have been brewing for three years and have had some great successes and a few horrible failures. Lately I have been getting some slight off-flavors. I think they might be caused by contaminated equipment that is hard to clean, such as hoses and carboys. My methods for cleaning are that I rinse everything clean immediately after use and store it away in the basement. When it is time to brew again, I soak everything in the no-rinse sanitizer (I assume that this is iodophor) and rinse it with water just in case the mixture might be too strong. When I wash my carboy with hot water, the steam shows brush marks on the glass that you couldn't see before. Some of my hoses are starting to yellow as well. The bottles are rinsed clean after use, stored in



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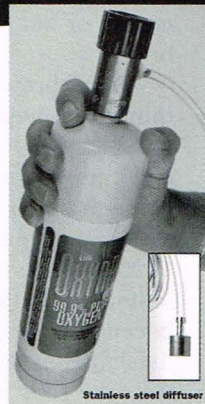
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the basement, and run through the dishwasher with heated drying on bottling day.

I am beginning to wonder if sanitizing is enough. I envision pockets of dried wort hiding inside my equipment growing lots of bacteria and waiting for the next feeding. What are the different types of cleansers available and how should they be used? I read an article that referred to trisodium phosphate, but I am hesitant to use something I know little about.

Shawn Poggemiller
Ottumwa, Iowa

There is no doubt that sanitization is one of the most important things a brewer can do to ensure good beer. I believe in and practice very rigorous sanitization methods when I brew. One thing that many brewers fail to recognize is the other component of a sanitization program: cleaning.

To properly sanitize any piece of equipment used for food or beverage handling, the item must be cleaned first. Cleaning means that organic debris is loosened and removed from the surface prior to using a sanitizer. This accomplishes several things. Cleaning increases the effectiveness of your sanitizer, because organic debris consumes the sanitizing power of most chemical sanitizers. Excess debris results in a dirty piece of unsanitized equipment.

Organic debris also can shield microorganisms from the sanitizer. Just as a shield can fend off the blows of a sword, organic debris can prevent microorganisms from coming into contact with sanitizing chemicals. In fact many microorganisms secrete extracellular slime that helps them attach to surfaces as well as protects them from chemical sanitizers.

Cleaning also drastically reduces the microbial load. In other words, cleaning washes microorganisms away. Most dishwashing detergents used in the home do not contain sanitizing agents and effectively remove microorganisms from smooth surfaces simply by acting as

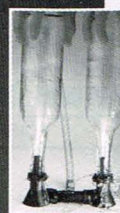
a detergent (known as a "surfactant" in cleaning lingo).

In practice sanitizing should really serve as an insurance policy to good cleaning. The fact is that a properly cleaned piece of equipment most likely could be used with minimal risk of contaminating the brewery without using a sanitizer. Many common cleaners used in the brewery, such as hot sodium

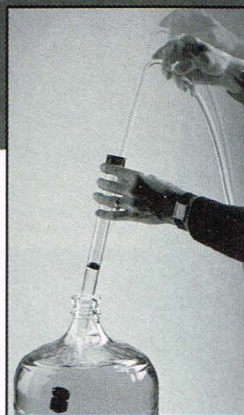
hydroxide or "caustic soda," carry with them the ability to kill microorganisms. My advice is to do an excellent job cleaning your equipment and use a sanitizer as a second line of defense to your cleaning. For the record, I recommend sanitizing everything that touches beer or wort after boiling.

There are many good cleaners that can be used. The safest cleaner

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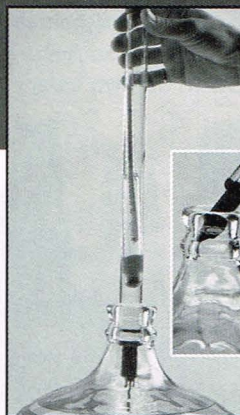


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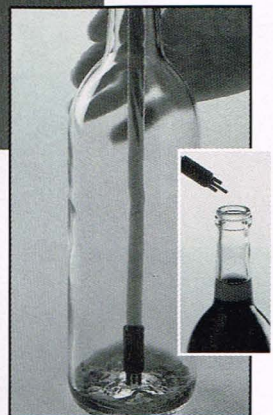
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Mr. Wizard

is a good dishwashing detergent coupled with elbow grease. Other cleaners, such as trisodium phosphate (TSP) and sodium hydroxide, have the added advantage of dissolving soils, but they are also less safe to handle. Certain mineral soils, such as beer stone, are not soluble in alkaline cleaners such as TSP and sodium hydroxide. Acids effectively remove mineral deposits. My favorite acid cleaner to use at home is white vinegar. I keep a gallon under my sink and use it to clean everything from hard water spots in the bathroom to my coffee maker. You can use just about any chemical cleaner on your brewing equipment as long as you thoroughly rinse the cleaner from the equipment before the sanitizing step.

A key to all cleaning is to remove debris without scratching the equipment. Scratches serve as hiding places for bacteria and make it very difficult to remove or kill all microorganisms. This includes carboys, hoses, pots, and other brewing equipment. Be careful using scrub pads and stiff brushes, especially ones with metal tips.

One last word of advice: Don't rinse "no-rinse" sanitizers. Remember that your sanitizer is an insurance policy. It is possible for water to contain spoilage organisms and rinsing off the sanitizer can undo all of your precautionary work. As long as your sanitizer is diluted as directed on the bottle, you should have no reason to rinse your equipment after cleaning and sanitizing. ■

Mr. Wizard's Address

Do you have a question for Mr. Wizard? Write to him c/o *Brew Your Own*, 216 F St., #160, Davis, CA 95616. Or send e-mail to wiz@byo.com.

Mr. Wizard, BYO's resident expert, is a leading authority in homebrewing whose identity, like the identity of all superheroes, must be kept confidential.

Porter and Frambozenbier for Fall

by Mikoli Weaver

Halloween has passed, winter is coming, and the holiday season is upon us once again. To have beer ready for drinking on Thanksgiving, we will start brewing this month's porter and frambozenbier right away.

The Scottish ale brewed last month is ready to drink, and the doppelbock will be ready for sampling November 14. But if you let the doppelbock sit until the end of the month, you will really notice an improvement.

Porter: Weaving the Threads

Although there are many different types of beers and beer styles in this country, almost all of the ales are of blue-blood descent. Some were born of practicality and others of pure market force and public demand. The most noteworthy example of the latter is porter. The porter style evolved out of the common 1700s practice of blending three or more of the most prevalent brews of the day, including browns,

pales, stouts, and various bitters. This was known as mixing threads.

Some signs would boast "three threads to be mixed here," while others touted five or even six threads available to be poured into a single pint. This task was particularly cumbersome and time consuming. So in 1722 an enterprising man named Ralph Harwood figured out that a beer could be easily brewed to have the characteristics of the three threads. He created a beer called "Mr. Harwood's Entire," the first porter from the Bell Brewhouse in Shoreditch, East London. It was first sold in a small Shoreditch pub called the Blue Last.

The Entire soon became very popular, and the owner of the pub started calling it porter in honor of his clientele: thirsty, working porters who transported bags and served as attendants on ships and at local hotels. This brewing style and service quickly spread throughout London, and in a short time porter became the drink of the people. Porter suffered a blow in the middle 1700s due to the low price of gin but was revived by breweries such as Courage, Whitbread, and Bristol.

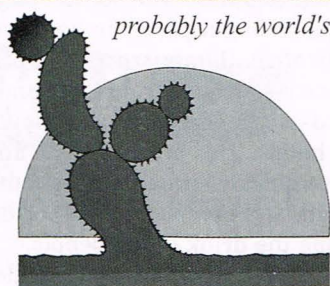
Today some very good English examples are Samuel Smith's Taddy Porter and Pitfield's London Porter, both rich in roasted barley and deep chocolate-malt flavor.

Technically speaking, there are two main types of porter. The first is robust porter, the typical dark almost black porter with the distinctive acrid character of roasted barley. Its flavor is very similar to the black malt flavor of an Irish stout. Robust porters are dry and highly reminiscent of dark roasted grain. The second type is brown porter, a less dark, sweeter version. It usually contains fewer hops, less



November 1999

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 PREP DAY • Assemble porter ingredients • Soak equipment in sanitizer • Start yeast	2 PREP DAY • Assemble frambozenbier ingredients • Soak equipment in sanitizer • Start 1 pt. yeast starter for frambozenbier	3	4 BREW DAY • Brew porter • Primary fermentation starts; check original gravity and record	5 BREW DAY • Brew frambozenbier • Primary fermentation starts • Check gravity; record	6
7	8	9	10	11 TRANSFER • Transfer porter to secondary • Check and record gravity	12 TRANSFER • Rack frambozenbier to secondary • Check and record gravity • Check for off-flavors • Continue fermenting for 1 more week at 67° F	13
14 TASTING • The doppelbock from last month is ready for sampling	15	16	17	18 BOTTLE • Record final gravity of porter • Rack, prime, and bottle porter	19 BOTTLE • Record final gravity of frambozenbier • Rack, prime, and bottle • Age at least 1 more week	20
21	22	23	24	25	26	27
28	29	30				



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alcohol (due to a lower degree of attenuation), and no roasted barley. The flavor is more concentrated toward caramel and brown malts, like a very dark brown ale.

The style guidelines for robust porter are: original gravity 1.045 to 1.060 (11° to 15° Plato), bitterness 25 to 40 IBUs, color at least 30° SRM, and alcohol by volume 5 percent to 6.5 percent. The brown porter is similar, with original gravity of 1.045 to 1.060 (11° to 15° Plato), bitterness 20 to 30 IBUs, color 20° to 35° SRM, and alcohol by volume 4.5 percent to 6 percent.

Porters, like other beers that originated in the United Kingdom, differ in form in the United States. It is almost always the case that American beers are lighter in alcohol, flavor, and color.

In addition to the imports mentioned, other English examples are King and Barnes' Old Porter, Darwin's Flag Porter, Fuller's London Porter, and Shepherd Neame Porter.

Excellent porters from the United States include Deschutes Black Butte Porter, Anchor Porter, Full Sail Imperial Porter, Woodstock Big Indian Porter, Wild Goose Porter, Back Alley Sugardaddy Porter, and Great Lakes Edmund Fitzgerald Porter.

Formulation — Malt and Hops

Porters reside somewhere between stout and brown ale, so the grain bill for porter is formulated as such. Our recipe is a bold, robust porter with 60° and 120° Lovibond crystal malts, brown malt, chocolate malt, and roasted barley. It will be pure black, dry, and full-bodied. The flavor will linger, but it will be much lighter than a stout. A very balanced, rich drink is what we are looking for, not an overbearing one.

Hops and hop rates for porter are pretty straightforward. English hops such as Goldings, Fuggle, Brambling, and others are best. Our beer will employ a Bullion and Kent

Goldings hops program.

English Yeast Strains

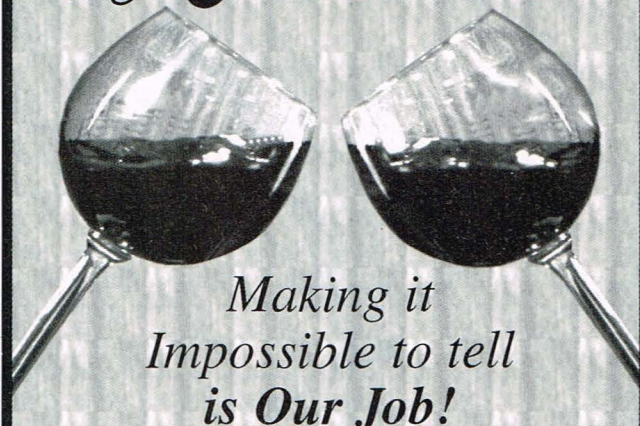
Any English strain of yeast will work, but some of the better choices are Wyeast 1275 (Thames Valley ale), 1335 (British ale II); any of the London series such as 1318 (London ale III); or White Labs WLP002 (English ale), WLP005 (British ale), or WLP023 (Burton ale). Dry yeast also works well (a good example is Whitbread's dry yeast), but dry yeast sometimes produces a bit too much diacetyl. Alternatively, a yeast can be cropped from a bottle-conditioned porter such as King and Barnes.

Frambozenbier: Fruit Beer for Real Beer Drinkers

Frambozenbier, or framboise, is a raspberry beer. *Framboise* is French for raspberry, and *framboos* or *frambozen* are Flemish and Northern Flanders for raspberry. Frambozenbier is generally based on a lambic base, although there

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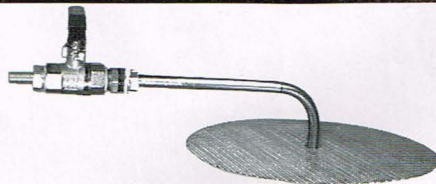
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Brewing Schedule Notes

Nov. 1, Monday Prep day for porter

Assemble all ingredients for porter, sanitize equipment, and start yeast culture for brewing on Thursday.

Nov. 2, Tuesday Prep day for frambozenbier

Assemble all ingredients for frambozenbier, sanitize equipment, and start yeast culture for brewing on Friday.

Nov. 4, Thursday, Brew day

Brew porter, record original gravity, and begin fermentation at 69° F for seven days.

Nov. 5, Friday, Brew day

Brew frambozenbier, record original gravity, and begin fermentation at 67° F for seven days.

Nov. 11, Thursday, Transfer

Rack the porter to a secondary and record the gravity. Continue for seven more days at 69° F.

Nov. 12, Friday, Transfer

Transfer the frambozenbier to secondary and continue fermenting for seven days. Assess the flavor of the beer, making sure it is free of off-flavors such as medicine, vinegar, or burnt wood (which indicate wild yeast or bacterial infection).

Nov. 14, Sunday, Taste day

The doppelbock from last month is ready for sampling. It is a big beer, however, and might need two to five more weeks of aging to eliminate sulfur and fruity flavors.

Nov. 18, Thursday Bottle porter

The porter should be ready to bottle today. Age at least seven more days before drinking (November 25, Thanksgiving).

Nov. 19, Friday Bottle frambozenbier

The frambozenbier should be ready for bottling. If gravity has not fallen to 1.008 (2° Plato), wait a few days. If it persists to be much higher, check for off-flavors and wait two to three more days for it to stabilize. Remember that bottling beer with leftover sugar can cause exploding bottles. It will age for one to two more weeks (November 26 to December 3).

December brews: Christmas ale and old ale.

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are examples of frambozen that are based on Belgian-style ales, for example Liefman's Frambozenbier. This light brown base will be the model for our beer this month.

Many lambic breweries and varieties can be found in the United States, but the main variety is framboise, even though it only makes up about 7 percent of the total amount of lambic produced in Belgium and was only introduced to the world in 1978. The simple Belgian ale is much more rare.

By the numbers frambozenbier should have an original gravity from 1.040 to 1.072 (10° to 18° Plato), bitterness of 10 to 20 IBUs, and alcohol by volume of 5 percent to 7 percent. There are no color recommendations for frambozenbier; it should reflect the color and amount of the fruit added. Our model falls on the lower side of the parameters, with an original gravity of 1.050 (12.5° Plato), bitterness 12 IBUs, and alcohol by volume 5.4 percent.

To compare and contrast various raspberry beers before brewing or after completing our style, try the Belgian examples of Lindeman's, Frank Boon, Alken-Maes (Belle-Vue), De Keersmaeker, and Liefman's.

Hops

Various combinations of aged Kent Goldings, French Strisselspalt, Brewer's Gold, Saaz, and Coigneau hops are traditionally employed in frambozenbiers. Aged hops lack the power to bitter the beer much, but they provide an interesting balance of stale hop flavors that actually work quite well. Hops for this and other Belgian styles are typically aged for one to two years. Obviously we will not be able to do this as long, but we can at least use authentic varieties and keep the bitterness in line. Our recipe calls for Kent Goldings and French Strisselspalt hops.

Brewing With Fruit

There are many ways to use fruit in beers. And there are just as many fruit products and forms. Traditional brewing for this and the

lambic style uses only whole, fresh fruit generally in the secondary fermentation.

This raises the questions of how to control sanitization and wild yeast if you do not want a spontaneously fermented product. There is really not much that can be done short of cooking the fruit to essentially pasteurize it before you add it to the fermenting beer.

There are, however, several alternative methods. The first is to add the fruit at the end of the boil, which accomplishes the same thing as cooking it but without losing any flavor. This is the way we will brew our frambozenbier. The amount used is really a matter of personal taste, but our recipe calls for 9.6 ounces per gallon, or three pounds for the five-gallon batch. The fruit will be



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1999 Style Calendar

November Porter, Frambozenbier

Two festive beers for the Thanksgiving holiday. A big porter and a French raspberry ale that makes fruit beer delectable.

December Christmas Ale, Old Ale

Starts off with a hoppy Christmas ale such as Sierra Celebration and an old (strong) ale like Pyramid Snow Cap.

boiled for the last 20 minutes in the kettle, then whirlpooled with the trub and hops. This method can result in a hazy beer (due to fruit pectins), but it is the authentic Belgian method.

The second method is to add the fresh fruit (cooked or not) to the conditioning stage, where cold temperatures and low beer pH will inhibit the growth of wild yeast.

The easiest way to deal with the addition of fruit is to use unsweetened juice or extract just before bottling. This adds only a small amount of fermentables (fructose)

and no contaminants. And the flavor can be added to personal taste, which makes it an exact science for the homebrewer. The downfalls to this method are that the flavor is not as fresh or deep in the finished product and the color imparted by the other methods is missing.

Yeast Strains

The easiest way to ferment frambozenbier is to use a Belgian yeast strain in liquid form such as Wyeast 1388 (Belgian strong ale) or 1762 (Belgian Abbey II); or White Labs

WLP400 (Belgian Wit). If you wish to crop a strain from a bottle, try the Brasseurs Biere de Garde or a similar ale that has no clove-type phenols or banana esters (Chimay and Corsendonk yeasts are not good choices, for example). If you want to try making a lambic base, use Wyeast 3278 (Belgian Lambic Blend). Be aware, however, that using lambic yeast cultures will dramatically change the character of the beer and create a very long fermentation time.

London Porter (5 gallons, all-grain)

Ingredients:

- 7 lbs. English two-row malt, such as Beeston Maris Otter
- 0.5 lb. carapils or dextrin-type malt
- 1 lb. crystal malt, 60° Lovibond
- 0.25 lb. crystal malt, 120° Lovibond
- 0.25 lb. brown malt
- 0.25 lb. chocolate malt

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- 0.25 lb. roasted barley
- 0.75 oz. Bullion hops (8% alpha acid, 6 AAUs) for 90 min.
- 0.75 oz. Kent Goldings hops (5.4% alpha acid, 4.1 AAUs): 0.5 oz. (2.7 AAUs) for 30 min., 0.25 oz. (1.4 AAUs) Kent Goldings at end of boil
- 1 pt. yeast starter of Wyeast 1275 (Thames Valley ale)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 3.25 gal. of 150° F water for 60 min. Sparge with enough 168° F water to yield 5.75 gal. of wort.

Total boil time is 90 min. At beginning of boil, add Bullion hops and boil 60 min. Add 0.5 oz. Kent Goldings hops and boil 30 min. At end of boil, add 0.25 oz. Kent Goldings. Whirlpool and cool to 69° F to pitch starter.

Ferment at 69° F for seven days, then rack to secondary. Continue fermentation for seven more days until gravity is about 1.008 (2° Plato). Prime and bottle. Age at least one more week before drinking.

Extract With Grains Option:

Substitute 6 lbs. light English malt syrup for the 7 lbs. pale malt. Specialty grains remain the same as above. Start with 5 gal. of water in boil kettle. Steep crushed grains at 150° F for 30 min. Remove bag and rinse with enough 168° F water to make 5.5 gal. Add extract. Total boil time is 60 min. At beginning of boil, add 1 oz. Bullion hops and boil 30 min. Add 0.5 oz. Kent Goldings hops and boil 30 min. At end of boil, add 0.25 oz. Kent Goldings. Whirlpool and cool to 69° F to pitch starter. Follow fermentation schedule for all-grain version.

OG = 1.052 (13° Plato)

Bitterness = 30 IBUs

Color = 30° SRM

5.6% ABV

Frambozenbier (5 gallons, all-grain)

Ingredients:

- 6.5 lbs. pale Belgian aromatic malt
- 0.5 lb. carapils or dextrin-type malt

- 1 lb. Belgian cara-Munich malt, 20° Lovibond
- 0.5 oz. Kent Goldings hops (5.4% alpha acid, 2.7 AAUs) for 60 min.
- 1 oz. French Strisselspalt hops (3% alpha acid, 3 AAUs) for 10 min.
- 3 lbs. fresh raspberries (or frozen unsweetened) for 20 min.
- 1 pt. starter of Wyeast 1388 (Belgian strong ale) or slurry from bottled frambozenbier
- 3/4 cup corn sugar for priming

Step by Step:

Mash grain in 3 gal. of 150° F water for 60 min. Sparge with enough 168° F water to collect 5.75 gal. of wort.

Total boil time is 90 min. Boil 30 min., add Kent Goldings hops, and boil 40 min. more. Add raspberries and boil 10 min. more. Add the Strisselspalt hops and boil 10 min. more. Whirlpool and cool to 67° F to pitch starter. Oxygenate/aerate well.

Ferment at 67° F for seven days,

then rack to secondary fermenter. Continue fermentation for seven more days until gravity is about 1.008 (2° Plato) or fermentation is finished. Let settle, rack, prime, and bottle. Age at least seven more days before drinking, preferably 14 days.

Extract With Specialty Grains Option:

Substitute 5.75 lbs. pale Belgian malt extract syrup for pale malt. Specialty grains remain the same as above. Start with 5 gal. of water in boil kettle. Steep crushed grains at 150° F for 30 min. Remove bag and rinse with enough 168° F water to make 5.5 gal. Add extract. Boil time is 60 min. Add Kent Goldings hops and boil 40 min. Add raspberries and boil 10 min. more. Add the Strisselspalt hops and boil 10 min. more. Whirlpool and cool to 67° F to pitch starter. Follow fermentation schedule for all-grain version.

OG = 1.050 (12.5° Plato)

Bitterness = 12 IBUs

5.4% ABV ■

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CIRCLE 37 ON READER SERVICE CARD

Take Control With Partial Mashing

If you are looking for a sure-fire way to make great homebrew without the commitment of a full mash, consider the benefits of partial mashing.

For a modest investment of time and very little in the way of equipment, you can get the flexibility and quality benefits of mashing with the convenience of extract brewing. Instead of mashing enough grain for a whole batch of beer, partial-mash brewers mash a small amount of pale grain, plus specialty grains for flavor and color — and use pale extract to reach the rest of their original gravity.

You can get excellent control of your gravity with partial mashing. And the method covers a multitude of gravity sins. For example if your mashing method is not quite right and you end up with wort that's too thin, it matters little if you plan to derive fermentables from extract, anyway.

George Hummel has been brewing for 15 years and has seen hundreds of recipes come and go as the owner of Home Sweet Homebrew, a homebrew supply store in Philadelphia.

"Partial-mash brewing really gives you the best of both worlds," Hummel says. "It offers the flexibility and control of full-mash brewing, without the total commitment of time and equipment. It also provides a nice safety net; in the event your mash is screwed up, you'll still end up with plenty of fermentables by adding extract," he says.

Hummel has won a wall full of ribbons, many of them for mash-extract beers. One of his trademark brews, "Big Ass Beer," regularly fools experts at festivals and beer tastings. "People taste it and can't believe it's got extract in it. It has all the taste attributes of all-grain beer but is easier to make," he says.

One advantage of completing a partial mash is that you can use adjuncts with full confidence. The conversion power of the barley malt is enough to convert other starches in the malt, even pure corn starch. Flaked barley, unmalted wheat, rice, maize, and any other adjunct grains are safe to add to the partial-mash recipe.

Advice From a Pro

Don Gortemiller is brewmaster

b y S a l E m m a





at the Pacific Coast Brewing Co. in Oakland, Calif. Pacific Coast is an extract brewery. But that has not stopped Gortemiller's beers from winning many awards, including gold, silver, and bronze medals from the Great American Beer Festival. For a time, Pacific Coast had the longest GABF winning streak of any brewery in the United States.

Gortemiller offers a variety of tips to keep mash-extract beer at its best.

"What often happens when the homebrewer goes from an extract to a grain brewer is that he throws away his old, crappy equipment and starts using some decent gear," Gortemiller says.

The old, scratched plastic bucket is traded for the glass carboy. The rusty, chipped enamel brewpot gives way to a nice stainless steel pot. A heat exchanger shows up. Gortemiller says these improvements in the brewhouse contribute more to improved homebrew than simply the

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switch from extract to grain.

But he adds that adding mash to extract recipes really helps, too, under the right circumstances. "The single most important aspect is probably the quality of the extract," he says.

Gortemiller uses only fresh extract in his brewery, and he only buys enough to get him through three to four weeks of brewing, so the turnover rate keeps it in top condition. "It's also important to store it in a cool, dark place. Extract can go moldy or even start to ferment if it is stored improperly. The cans that are available in the homebrew store are probably pretty good in terms of stability. Just be sure they are fresh when you buy them," he says.

Gortemiller likes extract that's neutral. It gives him a blank canvas to which he adds style, flavor, and color components with the mini-mash. "Good extract leaves no big calling card in the finished beer. Our string of awards attests to that," he says.

Fresh grain is as important as fresh extract. "It may seem economical to buy grain in a 50-pound sack for homebrewing. By the time you get to the bottom of that bag, the grain is not going to be that good," he says.

Both Hummel and Gortemiller agree that boiling the full volume of wort and force-chilling are keys to success with any recipe. "I can't stress to homebrewers enough the importance of fast chilling," says Gortemiller. "Trying to cool the wort with an ice bath — or worse, just letting it sit around for hours — is an invitation to contamination," he says.

Adding grains to your recipe can improve fermentation characteristics, too. "The extract process removes key vitamins and other nutrients that the yeast need for vigorous fermentation. A mini-mash is a good way to get some of those nutrients back into the kettle. However, even with partial-mash brewing, I recommend adding yeast nutrient. We do it here and it has always served us well," Gortemiller says.

Getting Started

One of the nice things about mashing a small amount of grain is that it requires little in the way of space or specialized equipment. A small cooler or an old brew bucket make fine mash tuns. You will need to create a false bottom for straining the mash. The commercial ones available at the homebrew shops are primo. But if you are

thrift-minded, you can make your own with a piece of brass or copper tubing and some old siphon hose.

A five-gallon bucket is plenty big enough to hold your mash and all your sparge water, so you do not even have to worry about trickle sparging. You will lose some temperature if the bucket is not insulated.

The other equipment you will need is an accurate thermometer,



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your brewpot, and a second large stock or soup pot for heating sparge water.

When you have chosen your recipe, crush the grains and add a quart of water to your brewpot for every pound of grain you plan to use. Leave the grain aside, for the moment. Bring the water up to around 170° F and add the grains a little at a time, stirring constantly.

You want the temperature to drop to around 150° F. If it stays too hot, add a little cold water. If it's cold, turn on the heat and stir constantly until the temperature is right. Taste it. It will be slightly sweet, cloudy, and very starchy.

Hold the grains at 150° F for around 45 minutes to give the starch in the malt a chance to convert to fermentable sugars. This can be achieved in one of two ways. The first is to cover the mash and keep it over very low heat on the stove, stirring and checking the temperature frequently. The second is to place

the whole covered pot in the oven, set at the lowest setting — around 200° F for the average oven. You still will have to stir and monitor the temperature if you use the oven method, but it lessens the risk of overheating and scorching the grain.

When the mash period is over, taste the mash. It should be very sweet and have a thinner, clearer consistency than when it started. At this point you could perform an iodine test as an indicator of whether starch-to-sugar conversion is complete, but it is not essential. Simply scoop out a teaspoonful of mash and place it in a white plate or bowl. Add a few drops of tincture iodine or iodophor. If the conversion is complete, the iodine will stay reddish-brown. If starch is still present, it will turn blue-black. If the iodine test fails, recheck your temperature and continue with the mash until the grain is fully converted. Be sure to discard the sample. Iodine is one thing you do

not want in your beer.

Toward the end of the mash period, bring your sparge water to a boil.

When the mash is done, take the sparge water off the heat for a few minutes so the temperature drops below 212° F. If you sparge with boiling water, you run the risk of leaching bitter, astringent tannins from the grains. The temperature of the water hitting the grains should be cooler than 172° F.

Close the crimp on the lauter tun hose. Pour a gallon or so of sparge water into the lauter tun, then gently transfer the mash to lauter. Let the mash settle. While you are waiting, wash your brewpot.

It's time to *vorlauf* (recirculate). Hold a bowl, pot, or large measuring cup under the lauter hose and open the crimp. When the container is full, close the crimp and pour the wort back into the lauter tun. Do this three or four times, until the wort runs clear. Carefully add the




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rest of the sparge water and let the grain settle.

Position your brewpot under the lauter tun. You can put it on a chair, with the lauter tun on the counter. Open the crimp just a crack. You want a slow trickle of wort, not a full rush.

Take a break while the lauter runs dry. It should take at least 20 minutes, maybe half an hour.

When all the wort is in the brewpot, add your extracts, mix well, bring to a boil, and add hops according to the recipe.

Drain Damage: Strong Belgian Ale (5 gallons, partial mash)

Corn starch gives this strong ale an extra kick. The pale malt has enough enzymatic power to convert the corn starch to sugar. This is a great partial-mash recipe, because the adjuncts and lots of extract add tons of original gravity to the rich-flavored mini-mash.

Ingredients:

- 3.5 lbs. pale malt
- 0.5 lb. crystal malt, 40° Lovibond
- 1 lb. corn starch
- 0.5 lb. flaked barley
- 1 lb. dark brown sugar (or dark candi sugar)
- 6 lbs. pale extract syrup
- 1.25 oz. Hallertauer hops (4% alpha acid, 5 AAUs): 0.825 oz. (3.3 AAUs) for 60 min., 0.425 oz. (1.7 AAUs) for 15 min.
- 1.25 oz. Fuggle hops (4% alpha acid, 5 AAUs): 0.825 oz. (3.3 AAUs) for 60 min., 0.425 oz. (1.7 AAUs) for 15 min.
- 2 Tbsp. Irish moss
- Yeast nutrient
- Belgian ale yeast (liquid culture)
- 2/3 cup corn sugar for priming

Step by Step:

Bring 5 qt. water to 170° F in your brewpot. Add crushed grains, barley, and corn starch. Mix well. Hold at 150° to 155° F for 45 min. to 60 min., or until the mash passes iodine test.

To sparge bring 2 gal. water to a boil in a separate pot. Let it stand off the heat for a few minutes to

allow the temperature to drop below 212° F. With the lauter spigot closed, add a few quarts of sparge water to the lauter tun, then the mash, and let it settle. Wash the brewpot while you let the grains settle. *Vorlauf* (recirculate) to set the grain bed and then add the remaining sparge water. Drain the mash tun slowly into the brewpot.

Add to the run-off the brown

sugar, extract, and enough water to bring level to 6.5 gal. Stir well and bring to a boil. Total boil is 60 min. At start of boil add 0.825 oz. Hallertauer hops and 0.825 oz. Fuggle hops. Boil 45 min. Add 0.425 oz. Hallertauer hops, 0.425 oz. Fuggle hops, Irish moss, and yeast nutrient (amount based on manufacturer's guidelines). Boil 15 min. more. Chill to 70° F and

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CIRCLE 33 ON READER SERVICE CARD

pitch yeast.

Ferment at 70° F for seven to 10 days. Transfer to secondary for 14 to 21 days. Prime and bottle.

OG = 1.070

FG = 1.012 to 1.014

Bitterness = 35 IBUs

Hail Britannia Special Bitter (5 gallons, partial mash)

The freshness, snap, and bright

malty flavor of English bitter is captured with the partial mash.

Ingredients:

- 1.5 lbs. pale English malt
- 4 oz. wheat malt
- 6 oz. crystal malt, 60° Lovibond
- 5 lbs. pale malt extract
- 1 oz. Northern Brewer hop pellets (9% alpha acid, 9 AAUs) for 60 min.

- 0.75 oz. Fuggle hop pellets (4% alpha acid, 3 AAUs) for 20 min.
- 1.5 oz. Goldings hops (4% alpha acid, 6 AAUs) for 5 min.
- 2 Tbsp. Irish moss for 15 min.
- Yeast nutrient
- English ale yeast
- 2/3 cup corn sugar for priming

Step by Step:

Bring 2 qt. water to 170° F in your brewpot. Add crushed English malt, wheat malt, and crystal malt. Mix well. Hold at 150° to 155° F for 45 min. to 60 min., or until the mash passes iodine test. Sparge as described in the Drain Damage recipe.

Add extract and enough water to bring volume to 6 gal. Stir well and bring to a boil. Total boil is 60 min. At start of boil, add 1 oz. Northern Brewer hop pellets. Boil 40 min. Add 0.75 oz. Fuggle pellets. Boil 5 min. more and add Irish Moss and yeast nutrient. Boil 10 min. more and add 1.5 oz. Goldings hops. Boil 5 min. more. Chill to 70° F and pitch yeast.

Ferment at 70° F for five to seven days. Transfer to secondary for 14 to 21 days. Prime and bottle.

OG = 1.045

FG = 1.010

Bitterness = 45 IBUs

Baby, It's Kölsch Outside German Ale (5 gallon, partial mash)

Ingredients:

- 2 lbs. pale two-row
- 1 lb. Vienna malt
- 4 lbs. pale malt extract
- 2/3 oz. Perle hop pellets (8% alpha acid, 5 AAUs) for 60 min.
- 2 Tbsp. Irish moss for 15 min.
- Yeast nutrient (amount according to manufacturer's guidelines)
- Continental ale yeast, liquid culture
- 2/3 cup corn sugar for priming

Step by Step:

Bring 3 qt. water to 170° F in your brewpot. Add crushed two-row and Vienna malts. Mix well. Hold at 150° to 155° F for 45 min. to 60 min., or until the mash passes iodine test. Sparge as described in

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CIRCLE 15 ON READER SERVICE CARD

the Drain Bamage recipe.

Add extract and enough water to make 6 gal. and bring to a boil. Total boil is 60 min. At start of boil, add Perle hops. Boil 45 min. and add Irish moss and yeast nutrient. Boil 15 min. more. Chill to 70° F and pitch yeast.

Ferment at 70° F for five to seven days. Transfer to secondary for 14 to 21 days. Prime and bottle.

OG = 1.048

FG = 1.010

Bitterness = 22 IBUs

George Hummel's "Big Ass Beer"

(10 gallons — two 5-gallon batches,
all-grain and extract)

For festivals and events Hummel uses a 10-gallon fermenter for bigger batches. Since his mash tun only accommodates five gallons, he brews two concurrent batches and blends them in the same primary.

It's an all-grain batch with doubled up specialty grains, followed by an all-extract batch with the same hop schedule. Quantities can be halved for a five-gallon batch.

Batch 1 Ingredients:

- 5 lbs. two-row Klages malt
- 1 lb. Victory malt
- 1 lb. Munich malt
- 1 lb. carapils malt
- 1 lb. crystal malt, 30° to 40° Lovibond
- 1 oz. Columbus hops (12% alpha acid, 12 AAUs) for 60 min.
- 2 oz. Mt. Hood hops (4% alpha acid, 8 AAUs) at end of boil

Batch 1 Step by Step:

Bring 9 qt. water to 170° F in your brewpot. Add crushed malts. Mix well. Hold at 152° F for 90 min. to 120 min., or until the mash passes iodine test. Sparge as described in the Drain Bamage recipe.

Add enough water to make 6 gal. Bring to a boil. Total boil is 60 min. At start of boil add Columbus hops. Boil 60 min. At end of boil add Mt. Hood hops. Chill.

Batch 2 Ingredients:

- 8 lbs. Alexander's pale malt extract

- 1 oz. Columbus hops (12% alpha acid, 12 AAUs) for 60 min.
- 2 oz. Mt. Hood hops (4% alpha acid, 8 AAUs) at end of boil

Batch 2 Step by Step:

Bring 6 gal. water to a boil, remove from heat, and add extract. Return to boil. Add Columbus hops and boil 60 min. At end of boil add Mt. Hood hops. Chill.

Combining Ingredients:

- Wyeast 1272 (American ale II)
- 1¹/₃ cup corn sugar for priming

Combining Step by Step:

Combine the two batches and pitch yeast.

Ferment at 70° F for five to seven days.

Transfer to secondary for 14 to 21 days. Prime and bottle.

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CIRCLE 39 ON READER SERVICE CARD

Take Heart with

WINTER WARMERS

While the term winter warmers elicits immediate recognition among many homebrewers and beer enthusiasts, it's not really a style descriptor. There are no set, published guidelines describing exactly what a winter warmer is. But quickly peruse the beer displays from most well-stocked stores and you'll find many commercial examples of seasonal beers with this term either in the name or elsewhere on the label.

Most beers that can accurately be called winter warmers share one or more characteristics, but the lack of rigid style guidelines allows creativity and variety. Most winter warmers have a high alcohol content. Alcohol levels of 6 percent alcohol by volume or more are the norm, with some winter warmers higher than 9 percent. There are some historic reasons for this. Alcohol is perceived on the palate as a hot or warming sensation, one that can extend into the back of the throat. Very strong distilled spirits

can extend this sensation even farther, down the esophagus and into the stomach, to result in the perception of an "inner fire."

Man historically has perceived the consumption of alcohol, especially in higher levels, as a warming activity. Consider, for example, the stereotypical legend of the alpine St. Bernard dog, equipped only with a small cask of brandy strapped about his neck, rescuing the half-frozen skier.

While our bodies might perceive the consumption of alcohol in this manner, in truth alcohol affects the body's circulatory system and works against the body's inner ability to regulate its temperature. Consumption of alcohol as a medical therapeutic against hazardously cold environmental situations, regardless of this perceived "inner warming," can be dangerous.

A Spicy History

Historically, any beer to be consumed during the depths of winter

by John Oliver



RICK HUDSON

had to be prepared during the fall months. So during a time of plenty, namely the fall harvest season, a brewer might take advantage of a bountiful harvest by increasing the malt bill for the beer he makes. This results in a much higher alcohol level in the finished product.

Many cultures have some sort of holiday or festival associated with the winter months. Beer has long been associated with ceremony, so it was common to have special beers brewed specifically to celebrate a particular holiday or event. They usually were brewed with higher alcohol than their everyday cousins to help fuel the festivities and, perhaps, provide a brace against the cold.

Many winter warmers also are infused with herbs or spices. This practice might have evolved for many reasons. The use of herbs and spices in brewing was common prior to the 1500s, when hops became widely accepted as a

flavoring agent. Foods to be stored for the lean winter months often were heavily spiced or seasoned as a preservative measure. Spices were commonly added to beer at the time, and the beverage was then referred to as *gruit*.

For holidays many ceremonial punches and other drinks collectively referred to as *wassail* were prepared with a heavy infusion of distilled alcohols and spices. *Wassail* was festive in nature, and the term has been traced to a common holiday toast meaning "to your health." In addition many references in holiday songs and carols still popular today refer to the *wassail*.

Winter was also a time of survival. During the harsh weather people were forced to remain indoors through a time of lean provisions. Living conditions often were crowded and rudimentary. This resulted in an environment where communicable diseases could thrive. Age was sometimes expressed in terms of the number of winters a person had survived. For example an individual might have been referred to as a "hardy soul of 38 winters."

Since herbs and spices were also forms of medication of the time, their use in a drink was thought of as a healthy restorative. Also, it is only natural to assume that brewers who were already accustomed to using spices and herbs in the preservation of their beer would choose to prepare a special holiday version or *wassail* for the winter celebrations.

The factors that contributed to an overall increase in the strengths of the beers, namely a bountiful fall harvest, might also have had a role in additional ingredients, such as fruits, vegetables, herbs, spices, and flowers, being added to the beer in large enough quantities to have a substantial effect on the final product.

Formulating a Recipe

The first point to consider in creating a winter warmer is also one of the easiest. To make a big beer, use an ample amount of malt

to get a healthy starting gravity. Depending on the alcohol level you desire, try to get an original gravity of at least 1.060 (15° Plato). If spices, herbs, fruits, or other flavoring agents will be incorporated into the recipe, consider sticking primarily with pale malts or light malt extract to prevent strong malt flavors from dominating the finished beer.

Winter warmers are good candidates for the introduction of additional fermentables in the form of adjunct sugar. Belgian *candi* sugar, brown sugar, molasses, honey, and any of the various syrups or sugars that find their way into holiday baking can boost the gravity and the alcohol content of the finished beer while contributing aromas and characters found in traditional holiday cakes, cookies, and other desserts.

Limit the use of any adjunct sugars to less than 10 percent by weight of the total fermentables to prevent excessive off-flavors and fermentation problems. In addition use a hard, rolling boil to contribute to the caramelization of malt sugars that will lend their character to the finished beer. But be careful to avoid actually scorching the wort or undissolved malt extract at the bottom of your brewpot. This can result in very un-holiday aromas and flavors similar to burnt toast or rubber.

As with any type of high-gravity, high-alcohol brew, it is imperative to use a suitable quantity of a healthy yeast. Preferably, use a starter from a liquid yeast culture.

While there are no guidelines as to whether a winter warmer should be a lager or an ale, it is important to select a strain that can handle the higher level of alcohol while still providing good flavor characteristics. Also, as the gravity of a beer increases, an extended fermentation and conditioning time is required to achieve maturation. So a good winter warmer is a beer not to be hurried. Allow the complex flavors to develop, blend, and mellow over time. The use of a two-stage fermentation is often a plus.



Although there is no official definition of a winter warmer, most commercial examples share a high alcohol content and many include the use of spices.



When deciding on a hopping level, consider whether any unusual flavoring agents will be added to the beer. If this is the case, it is usually best to be conservative in the use of hops. This prevents them from overpowering the flavors of the other ingredients. With higher levels of malt and alcohol, greater levels of hop bitterness are required to balance the sweetness and prevent the beer from becoming cloying.

One formula is to try for 25 to 30 IBUs of bitterness. If you use any unusual ingredients, minimize the flavor and aromatic contributions of the hops by limiting or even eliminating hop additions in the last 30 minutes of the boil. But there are no set rules for winter warmers. If high bitterness and flavor levels are what you enjoy, there is no reason the beer can't be highly hopped or even dry-hopped in the fermenter.

Adding Spices

There is no single way to add herbs, spices, or fruits to beer, but there are many variables to consider. In general when these types of ingredients are added to the boil, the heat of the boil can increase the pungency or effect of the ingredient. At the same time, boiling reduces any subtle aromatic characters by driving volatile compounds out of the beer and into the steam of the boil. Also, while boiling fruits or vegetables ensures sanitization, it also can act on pectin in fruit to create a haze in the finished beer.

Just as in cooking, the use of prepared, dried, or ground herbs and spices often results in a greater, more powerful contribution than the use of fresh herbs or spices, and boiling can intensify this even further. The use of fresh herbs or spices usually results in more delicate and rounded aromatics. The same goes for the addition of hops; introducing these ingredients into the latter stages of the boil can result in a compromise between extraction of flavors and loss of delicate aromatics.

Another way to introduce unusual ingredients is to add them to the fermenter or at bottling time,

after the bulk of fermentation is complete. Not only will this help prevent aromatics from being driven off with the escaping CO₂ of fermentation, it also will allow some level of control with the addition of ingredients, especially if you are using an herb, spice, or flavoring for the first time and are not entirely sure of how much to add to get the desired flavor. You can minimize the risk of creating an undrinkable batch of beer destined to be dumped on the flower garden in the spring. Simply add measured amounts of the ingredient into the beer slowly, tasting the beer after each addition.

There are many flavoring extracts and essences available that can be introduced into the beer at any point in the fermentation, right up to bottling time. These flavorings allow the experimental homebrewer to try ingredients that might not be available fresh locally for geographic or seasonal reasons. As

opposed to fresh fruit or spices, flavorings are controlled for consistency. This can aid in determining proper usage for a batch of beer. Also, introducing such flavorings into the bottling or kegging process can allow what normally would be one batch of beer to be split easily into two or more distinctly different beers with a common base.

Looks Count

At first glance the outer packaging might not seem to bear any relationship to what goes inside the bottle. But the major commercial brewers invest heavily in packaging because they know that the package on the outside prejudices the drinker to the flavor of the product on the inside.

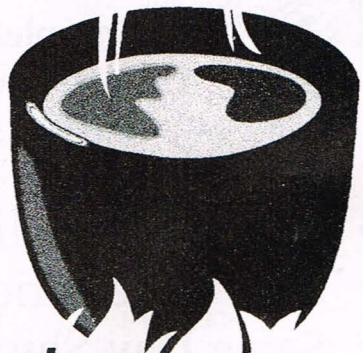
Because a winter warmer is a beer for a festive time of year, consider bottling in 22-ounce, "bomber" style bottles for sharing a drink with friends. Or try eight-ounce bottles for single servings.

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Either way, you'll want to linger over that extra-strong beer, preferably by the fire.

With the addition of a home-made label, winter warmers can further serve to warm the hearts of friends and relatives when they are shared or given as gifts during the holiday season.

The important thing to remember when concocting your own winter warmer recipe is that there really are no set rules. Look to the past, embody the spirit of the season, and let creativity reign to help design your own special seasonal homebrew that will elicit warm memories of winters past.

Valley Forge Winter Spruce (5 gallons, extract)

Spruce beer was a common colonial beverage in George Washington's time and no doubt would have been welcome during the cold winter at Valley Forge.

Ingredients:

- 10 lbs. dark malt extract
- 0.5 oz. Chinook hops (8.7% alpha acid, 4.4 AAUs) for 60 min.
- 1 oz. Centennial hops (6.9% alpha acid, 6.9 AAUs) for 30 min.
- 1 oz. Kent Goldings hops (5.2% alpha acid, 5.2 AAUs) for 15 min.
- Wyeast 1056 (American ale) yeast or 14 g Doric dry ale yeast
- 1 to 2 oz. spruce essence
- 2/3 cup corn sugar for priming

Step by Step:

Heat 5 gal. water and stir in malt extract just before boil. Total boil is 60 min. Add Chinook hops and boil 30 min. Add Centennial hops, boil 15 min. Add Kent Goldings hops, boil 15 min. more. Kill heat, cool to 70° F, and pitch yeast.

Ferment at 65° to 70° F for seven days. Rack to secondary and allow to condition for an additional seven days. At bottling time prime with corn sugar and add spruce

essence to your own taste (amount varies depending on type of essence). Bottle and age for three weeks.

OG = 1.074

FG = 1.017

Bitterness = 35 IBUs

Sleepy Bear Wassail (5 gallons, partial mash)

Ingredients:

- 5 lbs. two-row pale malt
- 0.5 lb. chocolate malt
- 0.75 lb. special roast malt
- 5 lbs. light malt extract
- 1 lb. of either honey or molasses, depending on taste
- 1 oz. Wye Target hops (8.4% alpha acid, 8.4 AAUs) for 60 min.
- 2 oz. Willamette hops (5.6% alpha acid, 11.2 AAUs) for 30 min.
- 1 Tbsp. fresh ginger, grated
- 1 tsp. freshly ground cinnamon stick
- 2 oz. vodka or grain alcohol
- Wyeast 1084 (Irish ale) or White



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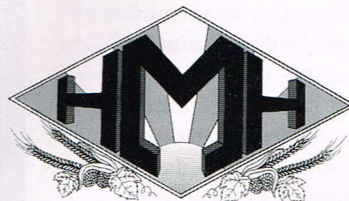
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- Labs WLP002 (English ale) yeast
• 1 cup dry malt extract for priming

Step by Step:

Heat 1.5 gal. water to 163° F. Mash in grains, hold at 150° to 153° F for 45 min. Sparge with enough 168° F water to collect 2.25 gal. in brew pot.

Top up to 5.5 gal. and bring to boil, stirring in malt extract just before the boil begins. Total boil is 60 min. Add Wye Target hops and boil for 30 min. Add Willamette hops and boil for an additional 25 min. Add either molasses or honey (or 0.5 lb. of each) and boil for remaining 5 min., then cool to 70° F and pitch yeast.

Ferment for nine days at 70° F, then transfer to secondary and allow to condition for 10 days at 70° F. When racking to secondary, steep ground ginger and cinnamon in grain alcohol for 10 to 15 min., then introduce all into secondary before transferring. After conditioning, prime with dry malt extract and bottle. Age for four weeks.

OG = 1.078

FG = 1.021

Bitterness = 49 IBUs

Old Man Winter (5 gallons, all-grain)

Ingredients:

- 12 lbs. British pale ale malt
- 5 lbs. DeWolf-Cosyns pale malt
- 0.75 lbs. DeWolf-Cosyns aromatic malt
- 1.5 lbs. crystal malt, 60° Lovibond
- 0.5 lbs. chocolate malt
- 1 oz. Magnum hops (11% alpha acid, 11 AAUs) for 90 min.
- 4 oz. Kent Goldings hops (5.2% alpha acid, 20.8 AAUs) 2 oz. (10.4 AAUs) for 60 min.; 2 oz. (10.4 AAUs) for 20 min.
- 1 tsp., Irish moss for 10 min.
- Wyeast 1728 (Scottish ale) or White Labs WLP028 (Edinburgh ale) yeast
- 2/3 cup corn sugar for priming

Step by Step:

Heat 4 gal. water to 167° F, mash in grains and hold at 153° to 155° F for 60 min. Sparge with

170° F water to collect 5.5 gal.

Total boil is 90 min. Bring to boil, add Magnum hops, and boil 30 min. Add 2 oz. Kent Goldings hops and boil 40 min. Add 2 oz. more Kent Goldings and boil 10 min. Add Irish moss and boil 10 min. more.

Cool to 70° F and pitch yeast. Ferment for eight days at 70° F. Transfer to secondary and condition

at 65° F for 10 days. Prime with corn sugar, bottle, and age for five weeks.

OG = 1.088

FG = 1.019

Bitterness = 58 IBUs

John Oliver is a BJCP Certified Judge who helps warm the sunny Southern California winters as head brewer for BJ's Brewery in Brea, Calif.

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by Todd Frye



Racking (*frustraticus trans-ferius*) is one of the most valuable skills the habitual homebrewer can possess. It is a very important part of the entire process, for the sake of beer clarity and flavor.

Simply put, racking is just a brewer's term for transferring beer from one fermenter to another. This procedure is done to lift your beer off of the sediment formed during fermentation. That sediment can contribute some undesirable flavors, so it is really best if you can leave it behind.

Racking can be done using gravity (place the full vessel higher than the receiving vessel), a pump, or a siphon. The most common method in homebrewing — and one that will never fail you — is siphoning.

Equipment

To rack beer using a siphon, all that's really needed is a length of siphon hose. But there are a few other pieces that make the job much easier.

Racking cane: A racking cane is a rigid tube of plastic or metal (less frequently), about 24 to 30 inches long, with a bend in the top. It is attached to the inlet end of the siphon tube and makes it easy to

direct liquid exactly where you want it to go.

Tubing (or hose) clamp: A tubing clamp is used to shut off the siphon tube.

Racking tube holder: Like a modified plastic clothespin, the racking tube (or hose) holder clips onto the neck or side of the fermenter and holds the racking tube in place.

These are the bare necessities for the easiest way to start your siphon.

Racking Basics

The first step in racking is to sanitize the cane and tubing. An iodophor solution will work well with the plastic.

Attach your racking cane to one end of the tubing. Put your full fermenter on a counter, and place the cleaned empty fermenter on the floor or a low stool. If you have a dishwasher with a very strong door — able to hold a 50-pound carboy full of beer — you can use it as a lower counter. It's wise to place a support, such as a block of wood, under the dishwasher door.

Cleanliness is important, so please do not attach your mouth and start sucking! The easiest way to

Fill It!

start the transfer is to fill the flexible tube with clean water and clamp off the end. Then place the racking cane into the full fermenter and the other end of the hose into a sink or another container. Then release the clamp. The action of the water flowing out of the tube will start the flow of beer up the cane and into the hose. Once the hose fills up with beer, shut off the clamp and put the hose into the clean fermenter.

Another important point to remember at this time is that you don't want to introduce any oxygen into the beer. So put the lower end of the siphon tubing all the way to the bottom of the fermenter. This stops the beer from splashing into the new vessel.

Sometimes a little bubble will form where the racking cane is attached to the siphon tube. Just pinch that spot a little to slow it down, and the bubble will flow right out the end of the tube.

There you have it. All you have to do is keep the end of the racking tube submerged and siphon without splashing.

Advanced Siphon Gadgets

Beyond siphoning's bare essentials there are many gadgets that

have been invented over the years to make this an easier task.

Two-hole stopper: The simplest siphoning gadget is a stopper with two holes. Sounds simple, but it really works great. With the same racking setup, put your racking cane through one of the holes so it will almost reach the bottom of the vessel from which you are racking. Stick a short length of tubing out of the other hole. Put the stopper in the top of the racking-from carboy, and put the lower end of the siphon hose to the bottom of the racking-to fermenter. Now all you have to do is pump air or CO₂ through the short length of tubing in the stopper, which will cause a pressure buildup inside the fermenter and "push" the beer up and out the racking cane and down into the other fermenter. No mess, no fuss!

If you are fortunate enough to have a carbon dioxide system, put no more than a pound of pressure into the short length of tube. Be very careful, however. Any more than a pound of pressure can shatter the carboy. If you don't have access to CO₂, you can use a hand pump or simply blow into the short end.

Auto-siphon: A new product,

the auto-siphon is a racking cane that comes with a 1-inch diameter cylinder of the same length. This cylinder has a one-way valve at the bottom that allows beer to be drawn into the tube only as the racking cane is drawn out, similar to a syringe. When the racking cane is pushed back down into the tube, the beer is forced down the siphon tube. This is really easy!

Siphoning Tips

Tip 1: If you find you need to practice siphoning, a great time to do it is when you are sanitizing the carboy you are going to transfer into. The easiest thing to do is to sanitize it and siphon the sanitizer out. This achieves two goals: you get practice on something that can't be ruined, and your carboy and siphoning equipment will be clean and ready to use!

Tip 2: If you are having trouble with the end of your siphon tube curling around and splashing against the side of the fermenter, there is a simple cure. If you have a plastic bottle filler, remove the tip, which leaves you with a length of rigid plastic tube. Attach that tube to the siphon apparatus, and it should straighten out your problem. 

Choosing

by Larry Lesterud

Hops occupy an exalted place among the building blocks that make a great beer. There's something special about an ingredient that can make a beer bitter and give it a delicate aroma, too.

Every brew with a new or unfamiliar hop variety becomes an experience made special by aromas sweet, pungent, floral, perfumy, or citrusy. And what brewer hasn't celebrated hops to the point of making a beer so overhopped that only the brewer could (begrudgingly, yet still in denial) drink the bitter elixir?

There are dozens of hop varieties, and hops from every major growing region are readily available to U.S. homebrewers. In addition, hop breeders throughout the world introduce new varieties each year. Choosing the right hops for your brew can seem difficult amid all the options.

The three best known growing regions are Germany, England, and the Pacific Northwest.

Beer styles originally developed

because brewers used indigenous grains and hops and local water. Climate and soil conditions dictated what grains and hops could be grown and thus defined the flavors of the beers that could be brewed.

Pilsner beers, named for the city of Plzen in what is now the Czech Republic, became nearly synonymous with noble hops (prized for their quality flavor and aroma), most particularly the grassy and slightly spicy aroma of Czech Saaz hops. Today, Saaz hops are almost exclusively reserved for lager beers, because their aroma is so distinctly associated with the style.

In Britain the English Goldings hop was cultivated circa 1775, and in 1875 the Fuggle hop was introduced. These two, the most widely known English hops, became the signature of English ales. Goldings varieties in particular have been prized. The hops company HopUnion USA in its catalog describes East Kent Goldings as "the undisputed finest ale hop in the world." The

Hops

heavier and maltier profiles of English ales are perfectly balanced by the sweet and slightly cloying aromas and flavors of Goldings and other English varieties.

In the United States, where much of the culture has been borrowed from other countries, including the brewing traditions, two hops stand out. They are the most widely grown aroma varieties in the United States: Willamette and Cascade. Both are cultivars of Fuggle.

Perhaps because of the popularity of Sierra Nevada Pale Ale, both an American beer style and an American hop cultivar have become the standard for the western region of the country. Sierra Nevada uses ample Cascade hops in the boil for its pale ale, and the Sierra Nevada Pale Ale has become the exemplar of the American pale ale style.

An American pale ale might be judged closest to style if it has ample Cascade aroma, while Goldings would be the hop of choice for an English ale. German beers

most often employ noble hops such as Hallertauer and Tettnanger.

Hops are available in domestic and imported varieties, for instance German Hallertauer and American-grown Hallertauer. While these are from the same breeding stock, the cultivars vary because of harvest-year variances, soil conditions in the regions, and climatic conditions.

Many of the world's great hops are grown in the United States and have been grown from cuttings or seedlings from the original stock. There are also cultivars of European origin that have been selectively bred in the United States to create a new hop. American Hallertauer derivatives include Liberty, Mt. Hood, Crystal, and Ultra. These might have aroma characteristics similar to the German Hallertauer, but essential oils and alpha-acid contents vary from the original cultivar.

Some of these hops can replace Hallertauer suitably, though many brewers argue that there is nothing like the original.



Making a Choice

Characteristics to look for when selecting a hop cultivar are alpha-acid content, co-humulone content, use as bittering or aroma, beer-style associations and traditions, aroma

Assessing Fresh Hops

by John Borlik

When selecting whole hops, take a look at the cones to assess their freshness and condition. The European Hop Producers Commission has a standard test for hops, awarding up to 100 points for value-enhancing properties, and deducting up to 30 points for value-decreasing properties. You can use their guidelines to pick the best hops available. The assessment includes:

- Crop purity (plus 1 to 5 points): The hops should be free from stems, leaves, and contaminants.
- Dryness (plus 1 to 5 points): In squeezing the hops together the cones should not stick together or lose their leaves; if too wet the hops become dark brown, odor is musty, and mold develops.

- Color and gloss (plus 1 to 15 points): The color should be yellowish-green, and the cones should have a silky sheen. Grey-green indicates unripe; yellowish-red over-ripe (oxidation).

- Cone shape (plus 1 to 15 points): Uniformly large, closed cones are favored.

- Lupulin (plus 1 to 30 points): There should be as many lupulin glands as possible and they should appear yellow to golden yellow, shiny, and sticky.

- Aroma (plus 1 to 30 points): The aroma should be clean, very fine, and strongly persistent. Off-odors include smoky, burned, onion, garlic, hay-like, grassy, straw-like, cheesy, and sulfury.

- Diseases, damage, seeds (minus 1 to 15 points): This

includes damage because of blackness (aphids), browning (spider mite or wind damage), reddish tips (strig midge), cone death and loss of bracts, bracteoles, and seed formation.

- Defective handling (minus 1 to 15 points): Includes brown or burned hops as a result of high drying temperatures, deterioration due to high moisture content, and off-odors.

To tally your results:

Less than 60 points = poor

60 to 66 points = average

67 to 73 points = good

74 to 79 points = very good

More than 80 points = premium

John Borlik is in charge of quality control at Kalamazoo (Mich.) Brewing Co.

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When examining a hop for aroma, crush the flowers in the palm of your hand and rub them

vigorously to release these oils. An accurate estimate of the aroma can't be made without this rough handling. Aromas range from citrus to perfume and from floral to grassy. Some smell vegetal while others smell quite sweet. Get to know the aroma of the hop well before it goes into your brew.

Flavor and aroma characteristics vary widely from hop to hop.

Try blending hops to see which aromas blend well and which varieties clash. Breweries most often use a blend of hops rather than just one variety. Keep in mind that not all hops will blend well. That sweet character of one blended with the spicy character of another might not meld harmoniously, and this is where the brewer's art comes into play. Finding the right combinations

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is often a matter of trial and error.

Hops that complement one another often run along pedigree lines. You might find that noble hops will blend well together, but a mix of German nobles and sweet English Goldings clashes. You might also find that the character of one hop brings out the character of another, much as salt brings out the flavor of garlic in cooking.

Data on pedigree is important to check when brewing with an unfamiliar hop. The pedigree gives some generalization of the flavor and aroma qualities to expect. If the pedigree is similar to a hop you are familiar with, generally you can expect a similar profile from the new hop. This is often but not always the case. Sometimes the genetic origin is similar, but selective breeding has changed the character of the hop.

Often, new hops are developed for ease of harvest, packaging qualities, resistance to plant diseases,

and increased yield per acre. The hope is to develop a variety with characteristics similar to the original but with greater profitability for the farmer and the hop processor. This is one of the reasons that a multitude of cultivars with similar qualities is available on the market. Still, no two varieties are the same, and it is best to compare side by side.

When selecting a hop variety, consider the goals you've set for your brew. Do you wish to emulate a style or a particular beer, or are you out to create something unique? When trying to duplicate a style of beer, use the hops associated with the style and region of the beer. Saaz hops epitomize lagers but might seem a bit out of place in a pale ale. Regional cultivars help to define beer styles, so select the most authentic ingredients to best duplicate a style.

Choose the hop you like the best and experiment. Many breweries

have brewed single-hop beers to feature the characteristics of a particular favored hop. There is no better way to become intimately familiar with a variety. By brewing with a single hop, you easily can learn the flavor and aroma qualities of a variety without the characteristics of another variety interfering. Hops blending is more common, but single-hop brews can help round out the brewer's education.

To learn more about specific hop varieties, look up hop suppliers such as Hopunion USA (www.hopunion.com) and Yakima Chief (www.yakimachief.com) on the Internet. Specifications include pedigree or hop origin, farming characteristics, and analytical data such as oil contents and alpha-acid percentage ranges, as well as trade perceptions of hop varieties.

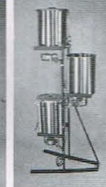
Larry Lesterud is head brewer at Humboldt Brewing Co., Arcata, Calif.

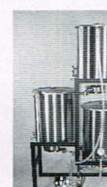
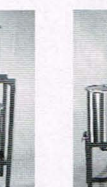
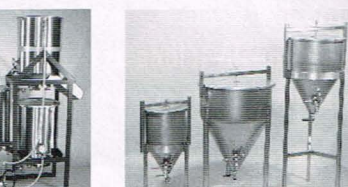


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Comparing and Selecting Hops

Name	Alpha Acid %	Typical Beer Styles	Possible Substitutions	Flavor Description
Admiral (U.K.)	13.5% to 16%	Ale	U.K. Target, U.K. Northdown, U.K. Challenger	Known for its bittering potential.
Ahtanum	4% to 6.3%			Floral, citrus, sharp, and piney.
Amarillo	8% to 9%	Ale, IPA	Cascade, Centennial	Citrusy, flowery.
Bramling Cross (U.K.)	5% to 7%	ESB, bitter, pale ale	U.K. Kent Golding, U.K. Progress, Whitbread Golding Variety	Quite mild, fruity currant aroma.
Brewer's Gold	7% to 8.5%	English ale	Bullion	Bittering hop with neutral aroma character.
Brewer's Gold (German)	6% to 7%	Ale, heavier German-style lagers	Northdown, Northern Brewer, Galena, Bullion	Black currant, fruity, spicy.
Bullion	6.5% to 9%	IPA, ESB, stout	Columbus, Northern Brewer, German Brewer's Gold	A rich hop primarily used for bittering. Intense black currant aroma.
Cascade	4.5% to 7%	Pale ale, IPA, porter, barleywine	Centennial, Amarillo, possibly Columbus	Pleasant, flowery, spicy, and citrusy. Can have a grapefruit flavor.
Centennial	8% to 11.5%	All ale styles, has been used with wheat beer	Cascade, possibly Columbus	Medium with floral and citrus tones.
Challenger (U.K.)	6.5% to 8.5%	English-style ales, porter, stout, ESB, bitter	U.S. or German Perle, Northern Brewer	Mild to moderate, quite spicy.
Chinook	10% to 14%	Pale ale, IPA, stout, porter, lager	Nugget, Columbus, Northern Brewer, U.K. Target	Mild to medium-heavy, spicy, piney, and grapefruity.
Cluster	5.5% to 8.5%	Ale and lager (good aroma for ale, good bittering for lager)	Galena	Medium and quite spicy.
Columbus	11% to 16%	IPA, pale ale, stout	Nugget, Chinook, U.K. Target, Northern Brewer	Pleasant, with pungent aroma.

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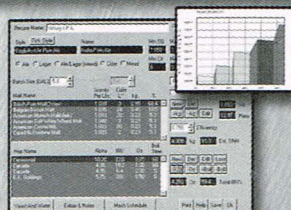
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CIRCLE 49 ON READER SERVICE CARD

Comparing and Selecting Hops

Name	Alpha Acid %	Typical Beer Styles	Possible Substitutions	Flavor Description
Crystal	2% to 4.5%	Lager, pilsner, ESB	Mt. Hood, Hersbrucker, French Strisslespalt, Liberty, Hallertauer	Mild and pleasant, spicy and flowery.
Eroica	9% to 12%	Wheat	Galena, Nugget, Chinook	Strong but pleasant aroma.
First Gold (U.K.)	6.5% to 8.5%	Ale, ESB	U.K. Kent Golding, maybe Crystal	A little like Golding family; spicy.
Fuggle (U.S.)	4% to 5.5%	Any English-style beer or American ale	U.K. Fuggle, Willamette, Styrian Golding, U.S. Tettnanger	Mild and pleasant, earthy and fruity.
Fuggle (U.K.)	4% to 5.5%	All English-style ales, ESB, bitter, lager	U.S. Fuggle, Willamette, Styrian Golding	Mild, pleasant, hoppy, and robust.
Galena	10% to 14%	Ale, porter, stout, ESB, bitter	Nugget, Pride of Ringwood, Chinook	Medium but pleasant hoppiness, citrusy.
Golding (U.S.)	4% to 6%	Pale ale, ESB, all English-style beer	U.K. Golding, Whitbread Golding Variety, U.K. Progress, and possibly the Fuggle family	Mild, extremely pleasant, and gently hoppy.
Hallertauer (U.S.)	3.5% to 5.5%	Lager, pilsner, bock, wheat	Liberty, Ultra, Hallertauer Tradition	Very mild, pleasant, and slightly flowery, some spicy.
Hallertauer Gold	6% to 6.5%		Crystal, Mt. Hood	Known for its aromatic properties similar to Hallertauer.
Hallertauer Mittelfrüh	3% to 5.5%	Lager, bock, wheat, maybe pilsner	Liberty, German Tradition, Ultra	Mild and pleasant.
Hallertauer Tradition (Ger.)	3.5% to 5.5%	Mild-flavored beers	Crystal, Liberty	Known for its aromatic properties. A replacement for Hallertauer Mittelfrüh.
Hersbrucker (German)	3% to 5.5%	Lager, pilsner, bock, wheat	Mt. Hood, French Strisslespalt	Mild to semi-strong, pleasant, hoppy.
Horizon	11% to 14%	Ale, lager	Magnum or a high-alpha hop	Pleasantly hoppy.

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Comparing and Selecting Hops

Name	Alpha Acid %	Typical Beer Styles	Possible Substitutions	Flavor Description
Kent Golding (U.K.)	4% to 5.5%	All English-style ales, ESB, bitter	U.S. Golding, Whitbread Golding Variety, U.K. Progress	Gentle, fragrant, and pleasant.
Liberty	3% to 6%	Lager, pilsner, bock, wheat	Hallertauer Tradition, Hallertauer, Mt. Hood	Mild and clean aroma, slightly spicy character.
Magnum	13% to 15%	All beers, particularly lager, pilsner, stout	Northern Brewer	Known for bittering value and quality.
Mt. Hood	3% to 8%	Lager, pilsner, bock, wheat	Crystal, French Strisslespalt, Hersbrucker	Mild, pleasant, and clean, somewhat pungent and resiny.
Northdown (U.K.)	7.5% to 9.5%	All ales, porter		Fruity with some spiciness.
Northern Brewer (U.S.)	6% to 10%	ESB, bitter, English pale ale, porter, California (steam) beer	Nugget, Chinook	Medium-strong with some wild tones.
Northern Brewer (German)	7% to 10%	ESB, bitter, English pale ale, porter	Chinook, U.S. Northern Brewer	Medium-strong with some wild tones.
Northwest Golding	4% to 5%	Ale, porter, stout, ESB, bitter		Known for aromatic properties.
Nugget	11% to 14.5%	Light lager	Columbus, Chinook, U.K. Target, Galena	Quite heavy and herbal.
Olympic	11% to 13%		Chinook	Mild to medium, citrusy aroma, spicy.
Perle (U.S.)	6% to 9.5%	Pale ale, porter, German styles	Northern Brewer, Cluster, Galena, Chinook	Known for its aromatic and bittering properties, pleasant and slightly spicy.
Perle (German)	6% to 8.5%	Pale ale, porter, lager	U.S. Perle, Northern Brewer	Moderately intense, good and hoppy, fruity and a little spicy.
Phoenix (U.K.)	4.2% to 5.5%	All ales	U.K. Northdown, U.K. Kent Golding, U.K. Challenger	Similar to U.K. Challenger.

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Comparing and Selecting Hops

Name	Alpha Acid %	Typical Beer Styles	Possible Substitutions	Flavor Description
Pioneer (U.K.)	8% to 10%	Ale, ESB	U.K. Kent Golding	A mild, typical English aroma.
Polish Lublin	3% to 4.5%	Pilsner	U.S. Saaz, Czech Saaz, U.S. Tettnanger	Mild and typical of noble aroma types, spicy, herbal.
Pride of Ringwood (Australia)	7% to 10%	Australian lager	Galena, Cluster	Quite pronounced, woody, earthy, herbal.
Progress (U.K.)	5% to 7.5%	Ale, bitter, ESB, porter	U.K. Kent Golding, Fuggle	Moderately strong, good aroma.
Saaz (Czech)	3% to 4.5%	Pilsner	U.S. Saaz, Polish Lublin	Very mild with pleasant hoppy notes, earthy, spicy, and herbal.
Saaz (U.S.)	3% to 5%	Pilsner, lager, wheat	Czech Saaz, Polish Lublin	Mild and pleasant, earthy and spicy.
Santiam	5% to 7.9%	Lager, American ale, pilsner	German Tettnanger, German Spalt, German Spalt Select	Noble characteristics.
Satus	12.5% to 14%		Galena	Known for its bittering and aromatic properties.
Simcoe	12% to 14%			A bittering and aromatic hop.
Spalt (German)	4% to 5.5%	Lager	U.S. Saaz, U.S. Tettnanger, German Spalt Select	Mild and pleasant, slightly spicy.
Spalt Select (German)	4% to 6%	Lager, and any beer where noble aroma is wanted	U.S. Saaz, U.S. Tettnanger, German Spalt	Very fine Spalter-type aroma.
Spalt Select (U.S.)	3% to 5%	German lagers	Tettnanger, Saaz	Medium intensity and pleasant hoppy qualities. Medium-strong aroma with wild American tones.
Sterling	6% to 9%	Lager, ale, pilsner	Saaz, Polish Lublin	Herbal, spicy, pleasant aroma, hint of floral and citrus.
Strisselspalt (France)	3% to 5%	Pilsner, lager, wheat	Mt. Hood, Crystal, Hersbrucker	Medium intensity, pleasant, hoppy.
Styrian Golding (Slovenia)	4.5% to 6%	All English-style ales, ESB, bitter, lager	U.S. Fuggle, U.K. Fuggle, Willamette	Delicate, slightly spicy.

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Comparing and Selecting Hops

Name	Alpha Acid %	Typical Beer Styles	Possible Substitutions	Flavor Description
Target (U.K.)	9.5% to 12.5%	All ale and lager	Fuggie, Willamette	Pleasant English hop aroma, quite intense.
Tettnanger (U.S.)	3.4% to 5.2%	German ales and lagers, American lagers, wheat	German Spalt, Czech Saaz Santiam	An aromatic hop, mild and slightly spicy.
Tettnanger (German)	3.5% to 5.5%	Lager, ale	German Spalt, German Spalt Select, U.S. Tettnanger, Saaz	Mild and pleasant, slightly spicy, herbal.
Tomahawk	15% to 17%	Ale	Columbus	Primarily a bittering hop.
Tradition (German)	5% to 7%	Lager, pilsner	Hersbrucker, Hallertauer Mittelfrüh	Very fine and similar to Hallertauer Mittelfrüh.
Ultra	2% to 4.1%	Lager, pilsner, wheat, finish hop in ales	Liberty, Hallertauer Tradition, Saaz	Very good to outstanding, some Saaz-like qualities. Aromatic properties similar to Hallertauer.
Vanguard	4% to 5.67%		Saaz, Hallertauer Mittelfrüh	Aroma similar to continental European types.
Warrior	15% to 17%	Ale, stout	Nugget	A bittering and aromatic hop.
WGV (Whitbread Golding Variety) (U.K.)	5% to 7%	Ale	U.K. Kent Golding, U.K. Progress	Quite pleasant and hoppy, moderately intense.
Willamette	3.5% to 6%	Pale ale, ESB, bitter, English-style ale, porter, stout	U.S. Fuggie, U.S. Tettnanger, Styrian Golding	Mild and pleasant, slightly spicy, fruity, floral, a little earthy.
Yakima Cluster	6% to 8.5%			Used as a kettle hop for bittering.
Zeus	13% to 17%		Columbus	Aromatic and pleasant.

**information provided by hop suppliers and compiled by Susan Mills*

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CIRCLE 47 ON READER SERVICE CARD

Growing Hops:

Planting Healthy Vines

by Scott R. Russell

Hops grow well in most areas of the United States. If you'd like to grow your own, the time to start is now. Whether you have existing vines or you're planting for the first time, a little spade work in the fall will make your plants healthier in the spring.

New Plantings

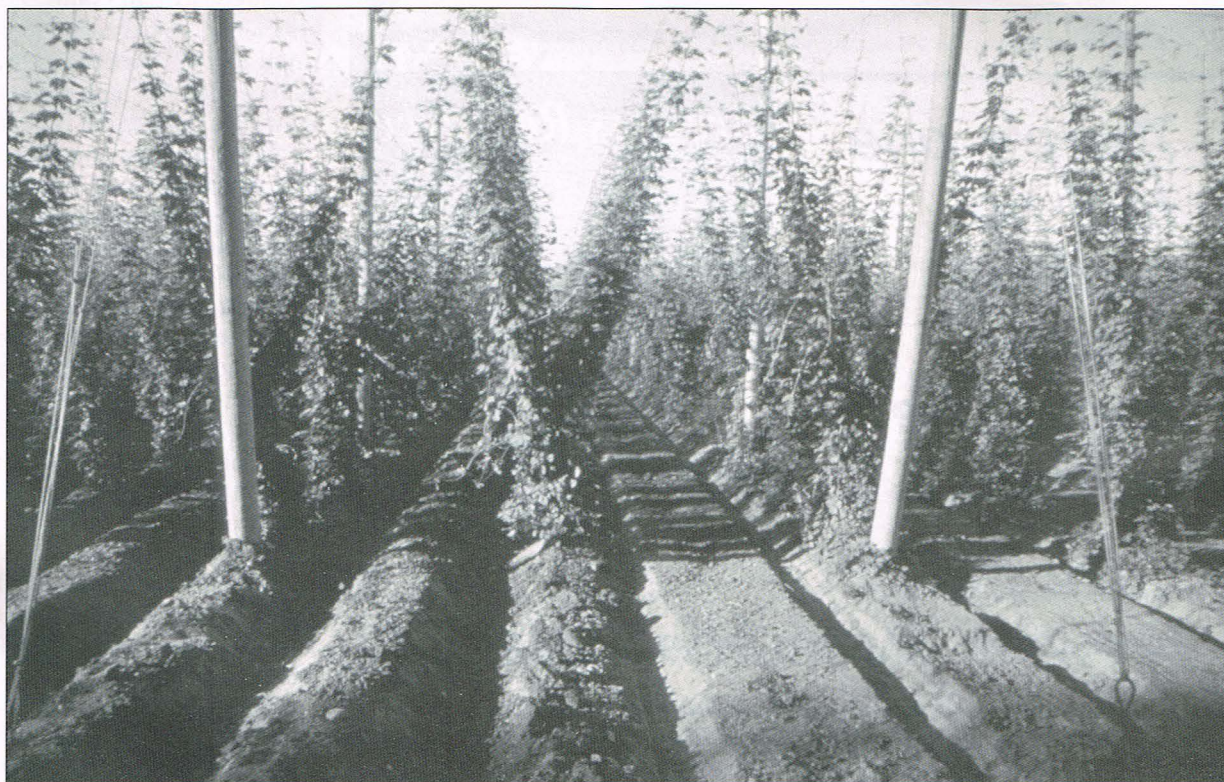
It's never too early to prepare the soil where you plan to plant hops. It helps to give it the winter to settle and energize, which means going out now and doing the first

few tasks.

1. With a post-hole digger or small spade, dig three circular holes, about 8 inches in diameter and 10 to 12 inches deep, arranged in a triangle with about a foot of space between the holes.

2. Put in the bottom of the holes:

- A 1-inch layer of wood ash
- A 1-inch layer of straw or grass clippings
- A 1-inch layer of some mellow already composted manure (sheep seems to be the best)



Now is the ideal time to prepare for healthy hops. For both existing vines and spring hop plantings, working the soil and adding fertilizer and mulch this fall will energize your soil.

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- A 3-inch layer of the topsoil you removed from the hole

Cover with a 3-inch layer of mulch.

3. Water well, then let age and settle for the winter.

In the spring, all you'll have to do is remove the mulch and plant your hop rhizomes in the topsoil as soon as it has thawed. Soil preparation can be done in the spring if necessary. But be sure to give the soil at least a couple of weeks to settle before you plant the hops.

Older Plantings

1. Mark down now which plants have overgrown the area in which they're planted. This will allow you to thin them in the spring (by digging them up as they begin to sprout, dividing them, and then replanting).

2. Fertilize and mulch your hops.

Hops, like all plants, need nutrients. There needs to be the right mix of nutrients in the soil before planting, and these same nutrients need to be periodically replaced or supplemented during the growing season as the plants feed and again during the winter as the plants rest and recharge.

Perhaps the best source of nutrients is organic manure, which is free of chemical pesticides and hormones that could actually harm your soil. Now, as the plants die back to the rhizome, is the best time to give them a good dose of fertilizer.

Cut the vines back to a few inches tall as soon as they have dropped all their leaves and turned brown or after the first hard frost.

Spread a thick layer (three or four inches) of a mixture of two parts soil, two parts manure, and one part wood ash over the area around the base of the vines. Cover with a thick layer of straw or grass clippings as mulch. In the spring, leave this mulch in place until shoots begin to poke up out of it. ■

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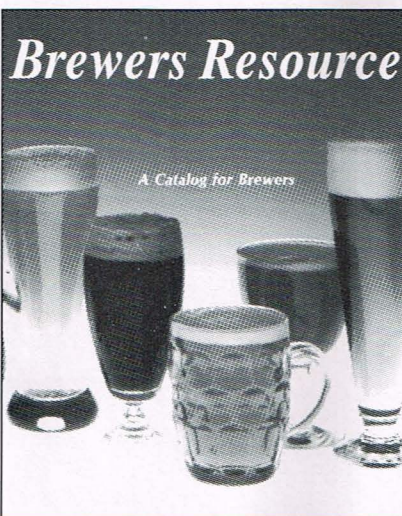
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Making Old-Time Country Wines

by Alison Crowe

Grape wine gets all the attention these days, but there was a time when home winemakers focused on beverages such as elderberry wine and dandelion wine. These old-fashioned relics hardly seem to register on the radar of modern home winemakers. There was a time, however, when wines made from the fruits, flowers, and vegetables that were locally and seasonally available were considered serious beverages.

In climates and seasons when grapes were not available, householders of old would use ingredients such as crab apples, carrots, and even tea leaves to craft delicious and distinctive drinks for the enjoyment of their family and friends. The day has long passed when home winemakers were restricted in their creativity by what they could grow themselves. But recreating these old-time recipes has its own flavorful rewards.

Batch Size

Even though these recipes contain such modern ingredients as yeast nutrient and pure tartaric acid, they are inspired by old recipes that our forebears followed to make their homemade wines. The recipes have been scaled down from the standard five-gallon batch so the curious can make a small amount first, while the creative can expand on these recipes and experiment on their own.

Dandelion Wine (1 gallon)

For our creative and industrious ancestors it was a natural to use what is essentially an unwanted weed to produce a pleasant and drinkable wine.

Here are some suggestions for

making dandelion wine. These rules of thumb apply to other herb- and flower-based wines as well.

First, it is best to harvest all wild ingredients far away from the pollution associated with car traffic and with herbicides and pesticides. Flowers and herbs should be picked in late morning or early afternoon, when the petals are dry but the day's heat has not drained them of important essential aromatic oils. It is also a good idea to wash and pick over any gathered flowers, fruits, or plants in a weak solution of sodium metabisulfite (10 parts per million will do). This removes dust, insects, and blemished material.

It is always wise when wild-crafting to consult a reliable guide — a person, book, or Web site — before gathering any material for winemaking.

Ingredients:

- 2.5 qt. dandelion flower heads
- 2.25 lbs. granulated white sugar
- 2 peeled, segmented oranges
- 0.5 lb. white raisins
- 1 tsp. tartaric acid
- 1 tsp. commercial yeast nutrient
- 1 envelope white wine yeast
- 1 Campden tablet

Step by Step:

Remove the stems and any green parts from the flower heads. These parts of the flower contain a white, milky liquid that could end up making your wine bitter if they are left in contact with the must. Soak the heads in a 10 parts per million solution of sodium metabisulfite, checking for bugs and other detritus. Place picked-over flowers, raisins, and orange segments into your primary fermenter of choice. White food-grade pails

make the best fermenters, but if you want to be really traditional, try an earthenware crock that holds about a gallon.

Pour 2.5 quarts of the best quality boiling water over the flowers and fruit. It's usually best to use bottled water. Cover the fermenter with cheesecloth and let it sit for two days, stirring the mixture twice daily.

On the third day make a simple syrup by dissolving the sugar into one pint of water and bringing the solution to a boil. As soon as the syrup boils, take it off the heat and set it aside until it's cool. While the syrup is cooling, strain the dandelion, raisin, and orange mixture into a gallon glass jug. This will serve as your secondary fermenter.

Proof the envelope of yeast in one-half cup warm water. Dissolve the tartaric acid and the yeast nutrient in a little warm water and add to the jug. Once the syrup has cooled, add it to the jug, stirring well to incorporate all the additions. Add the proofed yeast and top up the jug to the shoulders with boiled, cooled water. Top with a bung and airlock and leave in a warm, dark place to ferment to completeness.

When fermentation is complete, rack into another clean glass gallon

jug. Top up with more boiled, cooled water that has a crushed Campden tablet dissolved in it. Re-fit with an airlock and leave in a cool, dark place to mature for at least six months (a year is better), taking care to keep the airlock filled with sulfited water and to rack about every three months. If you'd like to finish off the wine with a little sweetness, liquid invert sugar with a little potassium sorbate (otherwise known commercially as "wine conditioner") can be added to taste.

Each tea
lends its own
particular flavor
and aroma
to the finished
product.

Tea Wine (1 gallon)

When things like tree fruit, elderberries, and dandelions weren't in season, folks would make wine with whatever plant-based materials were on hand. Tea has no fermentable sugar of its own, but it has plenty of tannin that gives this wine an interesting texture and taste. Any kind of tea can be used. Each tea lends its own particular flavor and aroma to the finished product.

Ingredients:

- 1/4 cup loose black tea leaves or 10-12 black tea bags
- 1 medium orange, washed, zested, and juiced
- 1 medium lemon, washed, zested, and juiced
- 1 lb. white or brown raisins, washed and chopped
- 2.5 lbs. white sugar
- 1 tsp. commercial yeast nutrient
- 1 tsp. pectic enzyme
- 1 envelope wine yeast, such as Prise de Mousse or Montrachet
- 1 Campden tablet

Step by Step:

Boil three quarts of good-quality water in a large stockpot or open kettle. When water comes to a boil,

Advertiser Index

	Page No.	Circle No.
American Brewers Guild	43	1
Asheville Brewers Supply	46	2
Austin Homebrew Supply	44	3
Beer and Wine Hobby	45	4
Beer, Beer & More Beer	40	-
Beer & Wine Crafts	46	47
Brew City/Market Basket	38	5
Brew King	17	6
Brewer's Resource	48	7
Brewsource	6	8
Briess Malt	Cov. II	9
California Concentrate	31	10
Cascadia/Cooper's	Cov. IV	11
Clearly Translucent	45	12
Crosby & Baker Ltd.	48	-
Cyberbrewing.com	16	13
E.C. Kraus	15	-
E.J. Wren Homebrewer Inc.	46	14
EZ Cap	12	-
F.H. Steinbart	26	15
Fermentap	15	-
Fermentation Technologies	6	-
Fermtech	11	16

	Page No.	Circle No.
Foxx Equipment Company	46	17
Grape and Granary	32	18
Great Fermentations of Indiana	8	19
High Point Designs	46	20
Hobby Beverage Manufacturing Co.	22	21
Home Brewery, The	41	49
Homebrew Adventures	12	22
Homebrew Heaven	24	24
HopTech	22	-
Jefferson Press Labels	46	25
Kestrel Manufacturing Inc.	8	26
Larry's Brewing Supply	18	27
LD Carlson Company	33	-
Liquid Bread, Inc.	10	28
Listermann Mfg. Co.	18	29
LOGIC, Inc.	14	30
Medicine Rock Division - Dakota Supply	31	-
Midwest Homebrewing Supplies	32	32
Morgan's Brewing Co.	Cov. III	-
Mosti Mondiale	25	33
Muntions p.l.c.	39	-
Northern Brewer, Ltd.	43	34
Northwestern Extract Co.	23	35

	Page No.	Circle No.
NY Homebrew	40	23
Ozark Home Brewery, The	10	36
Paulaner-North America	19	37
Portage Hills Vineyards	16	38
ProMash	41	48
Quoin Industrial	24	-
Siebel Institute of Technology	27	39
St. Louis Wine & Beermaking	46	-
St. Patrick's of Texas	14	-
Stainless in Seattle	51	40
Stout Billy's	46	-
Venezia & Co.	42	41
Vinotheque U.S.A.	51	42
White Labs	46	43
William's Brewing	42	44
Wine-Art Inc.	4	45
Zymotic Imports Ltd.	44	46

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take it off the heat and immediately add the loose tea or the tea bags. Let the tea steep for at least five minutes, and then strain the tea into your fermenter of choice. Add the chopped raisins, citrus juices, citrus peel, and 2.5 pounds of sugar to the hot tea in the fermenter. Stir well to completely dissolve the sugar, then let cool. Meanwhile, proof the envelope of yeast by dissolving it in one-half cup of warm water and letting it sit until bubbly.

When the mixture in the fermenter has cooled, add the yeast nutrient, the pectic enzymes, and the one-half cup of bubbly yeast solution. Cover the fermenter with a cheese-cloth and set it in a warm place to ferment until dry, stirring once daily.

When fermentation has ceased, strain the mixture into a clean glass gallon jar. Top up to the shoulders with cold tea into which a Campden tablet has been dissolved, and fit the jar with an airlock. Leave the wine to clear and mature in a cool, dark place for a month before serving.

A Few Alternatives

Additions and substitutions to these recipes can be made with a little creative thinking. If you've got some rosebushes that are out of control, harvest the petals just before they drop. Use the rose petals in place of the dandelions and perhaps use an organic fruit juice concentrate (grape or apple) in place of the orange segments and the raisins to make your own floral concoction.

Make an herbal wine, substituting basil (one-fourth cup dried or one quart fresh) for the tea in the tea wine recipe. Add 1 teaspoon of tannin with the rest of the ingredients once the basil infusion is cool, and continue from there. It's hard to make a mistake once you know the basics.

And besides, with volumes of only a gallon, it's hard to keep from trying your hand at such a time-honored and time-tested craft. ■

Alison Crowe works at Byington Winery & Vineyards in Los Gatos, Calif. She has a degree in wine-making from the University of California, Davis.

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Brewing Into Thin Air

by Olin Schultz

Some people who don't brew think that homebrewers are obsessive. They are right, of course. Take for example the Tribe homebrewing club of Colorado. A couple years ago they set the world record for brewing at the highest altitude when they brewed an extract batch of barleywine atop 14,433-foot Mt. Elbert in Colorado. You're probably thinking that's a safe record, for who in their right mind would want to do that? Us.

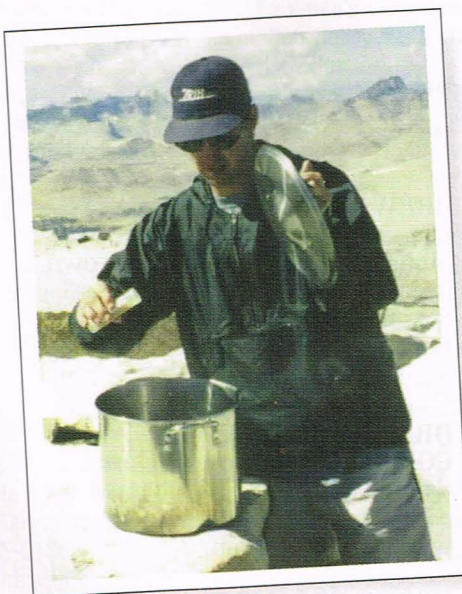
It all started in January 1998 when Scott Kaczorowski posted a note on the Internet stating that if he could find other people as stupid as he, we could break the record by brewing on the peak of Mt. Whitney (14,497 feet) in California. His comrades in stupidity signed up, and we started to plan our covert attack through e-mail correspondence. We decided that if we were going to do this, we wanted to do it the best we could: all-grain on top.

As reality set in and conversations turned to the dangers of hypoxia (a condition of low oxygen in your blood that is a serious concern at high altitudes) and the unpredictable weather up top, many brewers who had signed up to go backed out. Ultimately we were left with five brewers from California: Kaczorowski, Mike Cullen, Mike Rose, Regan Dillon, and me.

Sea-level preparations included assembling the brewing system: two two-gallon, food-grade, insulated buckets, which were used for the mash/lauter tun and the hot liquor tank. Recipe calculations had included the figuring of the boiling point of water at 14,497 feet: about 186° F. So hop utilization was calculated to be about one third that at sea level. We used one Whisperlite stove and about 11 ounces of fuel. To save time on top, where the

weather can turn without notice, we decided on a 30-minute mash, 30-minute sparge, and 30-minute boil. Because of the shortened boil and lower boil temperatures, a single hop addition was used.

On September 20, 1998, the group convened at the Whitney Portal base camp, which rests at 8,500 feet, to meet for the very first time. Kaczorowski had to back out at the last minute due to an injury, but he still came to see us off. After we mourned his loss over a beer, equipment was distributed four ways instead of five and the pot was strapped to the back of Rose's pack after he lost a game of roshambo (just kidding; he volunteered.)



Brewing at high elevation paid off in terms of setting a world record.

Monday morning we ascended the mountain. After a five-hour hike with heavy packs we reached High Camp, which rests at 12,000 feet. We spent the rest of the afternoon acclimating to the altitude and

setting up camp.

Tuesday morning we woke up before sunrise and it was below freezing. Before leaving camp we pumped about eight gallons, or 64 pounds, of water for brewing and drinking, then hit the trail again. The grueling hike took us longer than expected with all the extra weight.

We reached the top at noon and began brewing immediately. We mashed in at 175° F and it dropped 20° F to 155° F. We were aiming for a high mash-in temperature to aid in heat retention and quick starch conversion. Our concerns over heat loss during the mash were unfounded as we had a 0° F drop in temperature over a 30-minute period. Then we sparged and recirculated until the run-off was pretty clear. The boil was pretty vigorous given the altitude and our small stove.

After the boil we ended up with a little more than two gallons of wort. We were lucky enough to find an icy patch nearby, and we cooled for about 30 minutes. Then we pitched the yeast. We were all finished by 3 p.m. After signing the book on top and claiming the world record as our own, we packed up and headed back down the mountain. (The beer fermented nicely. The flavor was clean and malty, with nice hop aroma and flavor.)

It was a great experience shared with great people/brewers. How many times in your life do you get a chance to set a world record and brew a batch of beer in the same day? The four of us who brewed on the peak will always remember it as the day we brewed into thin air. ■

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