

# Brew

OCTOBER 2000, VOL.6, NO.8

SPECIAL  
EXTRACT ISSUE!

THE HOW-TO HOMEBREW BE

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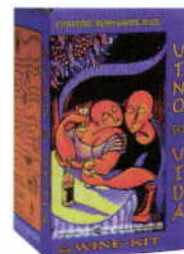
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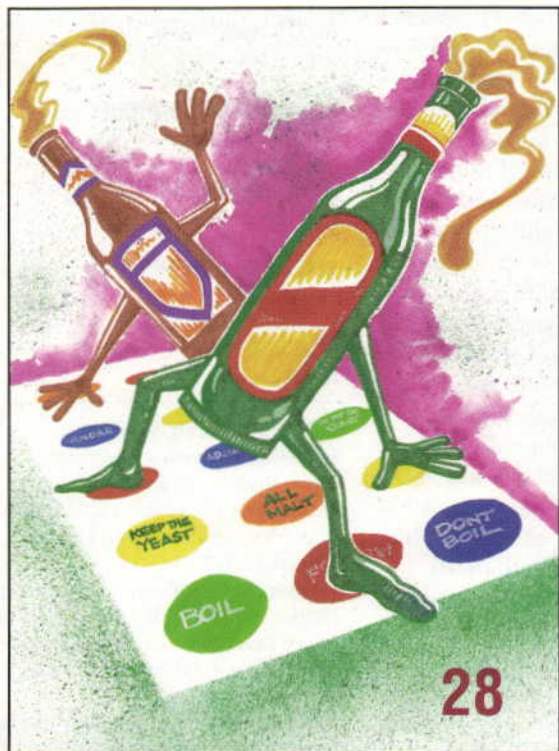
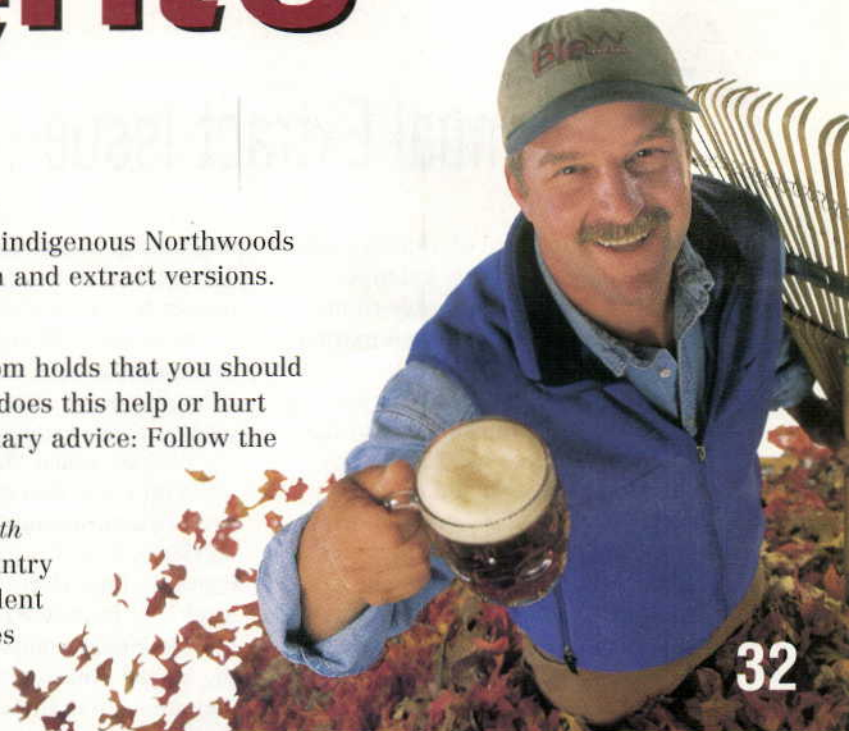
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## The Annual Extract Issue

Unless you're extremely ambitious, your first batch of homebrew probably came from a can — a can of malt extract, that is. For the vast majority of homebrewers, extracts offer an easy and convenient introduction to the hobby. Like Brad and I did, many homebrewers soon add specialty grains to their extract-based brew, then experiment with partial mash and all-grain techniques. Others stick with extract, period, or return to it whenever they're in the mood for a quick and easy afternoon brewing session.

"There are millions of homebrewers in the world," writes author Mark Henry in his excellent essay on extracts that begins on page 28. "Almost all of them are interested in making good beer. But plenty of them are not interested in spending six hours in the kitchen with three pots, a flamethrower of a burner and \$600 worth of stainless steel." Our own annual reader surveys prove Henry right: Fifty-eight percent of our readers brew only with extract, while another 30 percent split their time between extract and all-grain sessions. The remaining twelve percent stick solely to all-grain brewing.

We kept those statistics in mind while planning this issue, our annual tribute to malt extract. The centerpiece is a ten-page package by Dawnell Smith, a former professional brewer at three Alaskan micros: Sleeping Lady, Midnight Sun and the Skagway Brewing Company. Smith, who lives in Anchorage and now makes a living as a freelance writer, contacted homebrew shop owners from around North America to compile 20 excellent extract-based recipes for the autumn season. Besides raiding their recipe

files, she also asked these experts for tips on personalizing and improving extract beers. Her story starts on page 32 and includes great recipes for a wide variety of hearty fall styles, from Oktoberfests to winter warmers, porters and old ales.

We also asked Mark Henry to write an essay that might surprise you. An award-winning homebrewer, Henry is now a partner in Cascadia Importers, the North American importer for Coopers beer kits. As Henry points out, here in the United States, conventional wisdom holds that you should always boil preheated malt-extract beer kits. But does that help or hurt your beer? Henry offers some revolutionary advice: Follow the instructions in the kit! The article also includes a recipe and step-by-step instructions for replicating Henry's "Very Good Cream Ale," which won high scores at a regional contest held in Seattle.

Don't get me wrong: I think all-grain brewing is terrific. And in each issue of Brew Your Own — including this one — we offer plenty of techniques, information and recipes that help all-grain brewers make better beer. But I think extract brewing is great, too. Just the other day, Brad and I got the urge to brew and whipped up an extract-based batch of red ale in about an hour. It's in the fermenter and promises to be quite tasty. Fine homemade beer in less than 90 minutes. This has a certain appeal.

Have fun following our twenty excellent extract recipes! ■

KATHLEEN

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*Brew Your Own*  
5053 Main Street, Suite A  
Manchester Center, VT 05255

Tel: (802) 362-3981  
Fax: (802) 362-2377  
E-Mail: BYO@byo.com

### Advertising Contact:

Kiev Rattee  
kiev@byo.com

### Editorial Contact:

Kathleen James Ring  
kath@byo.com

### Subscriptions Only:

*Brew Your Own*  
P.O. Box 469121  
Escondido, CA 92046

Tel: 1-800-900-7594  
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## Health-Food Homebrew

I just read about other-than-barley brewing in "Not Just for Breakfast" (*"Recipe Exchange," Summer 2000*). Living in Hollywood, California, I have access to four or five homebrew shops, but they're at least 15 miles away! In LA, that's a long drive.

Instead, I went to a nearby health food store desperately searching for fermentables and hops. Lo and behold, I found brown rice syrup, malt powder and syrup, different kinds of cane and beet sugars, dextrose (corn sugar), honey, agave extract and fresh Cascade and Centennial hops.

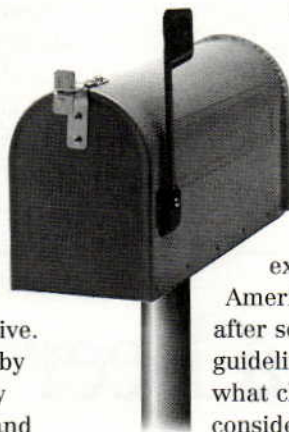
Using a Sierra Nevada yeast culture, a few 12-ounce containers of brown rice syrup (pure maltose), some malt powder (maybe 10 to 15 percent), honey (10 percent), a touch of molasses, fresh hops (one ounce per gallon) and home-roasted huskless barley, I have brewed some wonderful beers. No one knows I use anything but barley.

I've found that avoiding oily or protein-rich grains is key when brewing non-malt beers (but I love oats — I've used them in many beers to add a creamy chewiness). I also use a good protein rest when mashing (122° F). I thought you might like two cents' worth of comments from a humble homebrewer.

Tom Healy  
Hollywood, California

## Category Quandary

I just brewed the tasty Roggenbier recipe from January's "Style of the Month." My problem is that there's no official competition class that covers this great beer. I have been brewing for a number of years and for the last two years have been submitting my better concoctions to various competitions. My own brewclub, "Brewnosers" out of



Halifax, Nova Scotia, is hosting the 2000 "All About Ales Homebrew Competition" this December. I followed the recipe to the letter with the exception of using the American Wheat Yeast, yet after scanning the class guidelines still do not know what class of ale fits. I have considered either the English Pale Ale or perhaps the North American Pale Ale. Can you direct me to the correct category?

Greig M. McKellar  
Halifax, Nova Scotia

According to BYO contributing writer and experienced beer judge Scott Russell, most homebrew competitions should include an "other" category. Since roggenbier is a category unto itself, "other" is really the only category that applies! Good luck with the annual Brewnosers competition.

## Double Duty

My brew partner and I graduated to all-grain brewing about a year ago. We have had excellent results; however, we have brewed only five-gallon batches. Considering the time spent mashing and sparging, we have discussed doing 10-gallon batches and eventually moving up to keggings. All of the recipes that I have found are for 5 gallons. Is there a formula to convert these to 10 gallons? Do we double everything, including the hops?

Joe Campbell  
Lincoln, Rhode Island

It wouldn't work out exactly that way if you were going from 5 to 10 barrels, but for 5 to 10 gallons, doubling the recipe should be effective. One thing to remember about your old recipes on your new system:

## MaiL

*They will probably turn out different. The same recipe brewed on two different systems usually produces a different beer. You will need to tweak the recipes a little, but that is no reason not to proceed. You're correct, it really isn't any more work, especially if you are going to keg. Congrats! You have just worked out a solution to one of the more frustrating aspects of homebrewing*

*... running out of your favorite batch of homebrew!*

### Sterilization Issues

I am 64 years old and have been making homebrew since I was about 15 years old, when an older friend gave me a six-gallon crock and a capper and told me how to make beer with Pabst Blue Ribbon cooking malt. My reason for writing

is on the subject of sterilization that seems to be so important in everybody's beer literature. This may come as a surprise, but I have never sterilized anything! Not bottles, not the vat, not anything. I have never used bleach or any other agent of any sort. I once mentioned this to a storekeeper (who was trying to sell me equipment), and he said I was just plain lucky I hadn't poisoned myself yet. Have I been just plain "lucky" all these years? Did old-time brewers (hundreds of years ago) sterilize their equipment?

*Frank Moss  
via e-mail*

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*You are indeed a lucky brewer. The idea of sterilizing brewing equipment is fairly recent, but old-time brewers had all sorts of problems with microbiological contamination and had myriad names to describe the various defects. Many people think Louis Pasteur studied milk, but it was problems in the beer and wine industries that led him to the idea of destroying spoilage organisms with heat. Today this process bears his name (pasteurization) and stands as a reminder that food products prepared in the cleanest environments are still subject to spoilage. Whatever you're doing to beat the odds, keep it up!*

### Found it on the Web

I just logged onto your Web site ([www.byo.com](http://www.byo.com)) for the first time, and it helped me find an article that I was looking for from several years ago (specifically "Recipe Calculation" from October 1995). I have all of the old issues, starting with the Vol. 1, No. 1 premiere issue. Usually when I want to refer to an old article it is a chore to try to find information from several years back. The index listed on your web site was a real help (especially since my memory about the article was faulty). I just wanted to thank you for the very helpful index! ■

*Glenn Focht  
via e-mail*

CIRCLE 38 ON READER SERVICE CARD

# Munich Meets Long Island

Lederhosen, party cams and twelve cases of homebrew

John DiGiorgio • Hicksville, New York



PHOTO COURTESY OF BIG D LAGER PARTY CAM

John demonstrates the one-handed lift at his annual Oktoberfest.

**T**HE ONLY THING I LOVE more than the first taste of a new batch of homebrew is the opportunity to share it with all of my friends. One day, five years ago, it dawned on me ... an Oktoberfest! What a great way to bring together all of my friends and

**I WEAR LEDERHOSEN AND THE BUSHIEST FAKE SIDEBURNS THAT MONEY CAN BUY.**

family to celebrate our friendship and — my second love — beer.

The party has come a long way in five years and now draws over 100 people. My guests are always welcome to bring along whoever they think might enjoy the experience. We brew five or six different styles of beer each year and serve lots of German food. Occasionally, I subject the guests to a raucous verse or two of "Ein Prosit."

The party has gotten so huge

that I no longer can brew enough beer — if I want to keep my day job. The homebrew goes fast. I brew twelve cases for my party and they're gone as fast as my friends can pop the tops. The guests always make it a point to try each style. A tear comes to my eye when I see a friend who has swilled nothing but Coors Light since the day he was legal, throw caution to the wind and take a hearty swig of a blueberry porter. I love seeing all those people carrying around bottles with my funniest labels on them, like the one with me dressed as a woman, though my mother might not appreciate that one.

It's all about presentation. My beautiful wife Porzia dresses as a barmaid and I greet guests wearing German lederhosen, made by her Italian mother, and the bushiest fake sideburns that money can buy! We put up a tent in the backyard that's large enough to support the ever-increasing number of guests and turn on the "Big D Lager Party Cam." My guests love this. They ham it up all night for the camera. Thousands of pictures are snapped automatically throughout the evening to capture all the festivities (and a few surprises) and I post the pictures on the Big D Lager Website the next day. Feel free to log on to my site, [www.BIGDLAGER.com](http://www.BIGDLAGER.com).

We put a lot of time and money into the party each year, but it's well worth it because it helps us to keep in touch with our friends and gives us an excuse to get together for a great time. We may not get to see some people the entire year, but there is always Oktoberfest! →



PHOTO COURTESY OF DAVID HAHKLOTUBBE

David and Julie happily stir it up together in preparation for their upcoming nuptials.

David Hahklotubbe  
Walnut Creek, California

MY FIANCÉE AND I RECENTLY brewed our wedding mead together. She's not really a beer fan but liked the idea of brewing a traditional Celtic wedding mead.

Our wedding will be held in October on Native American land in Oklahoma and will be a traditional Choctaw ceremony. Our reception will be in California, where we live.

In addition to the mead, we will be serving over 60 gallons of homebrew including a strawberry blond (for obvious reasons). All of this will be served on tap via my "kegerator."

We brewed our mead last spring with the intent of aging it for more than a year. The last gravity recording was 0.998! This mead is smooth, colorful and makes you feel good all over. Just like our relationship.



COURTESY OF POLAR WARE

## Brewing alfresco from dawn to dusk

PHOTO COURTESY OF DWIGHT FRYE



The Bay Area Mashers pause to admire their outdoor brewery.

**I**T WAS UNSEASONABLY HOT for fall. The sun struggled to rise above the horizon as the mashers infiltrated the camp. In single file, the transports filled with kettles, propane, malted grains, yeast cultures and aromatic hops entered the eucalyptus grove. The forest became eerily quiet. A raven's caw announced the dawn and the

fifth annual "JamBEERee" of the Bay Area Mashers commenced.

The tools were unloaded, the kettles filled with water and the roar of 50,000-BTU burners echoed throughout the forest. Only the brewers held the secrets of the mission and only the brewers knew the magic of the wort.

Each fall, the Bay Area Mashers assemble at a local campground for a full day of brewing beer, drinking homebrews and telling lies around the campfire. Last year's event was the fifth annual "JamBEERee." Each year we have a goal — to brew 100 gallons of beer. And each year we have proudly succeeded.

Brewing in the wilderness is easy as long as you have adequate amounts of clean water. The only problem is when all of the first

batches are ready at the same time. This is where we get creative.

We always bring seven water hoses with us. As each kettle gets ready for the chill, a hose is attached to the output end of a chill coil already in use, then connected to the next coil.

By 5 pm, close to 100 gallons are in carboys and supplied with yeast. We don't stop until we reach the magic number. By dusk all 100 gallons must be in carboys with the airlock firmly attached.

Then we sit in front of the campfire and drink from the kegs of our previous batches. Sometime after midnight, the last keg gurgles, the last glass is drained and we crawl into our tents for the night. ■

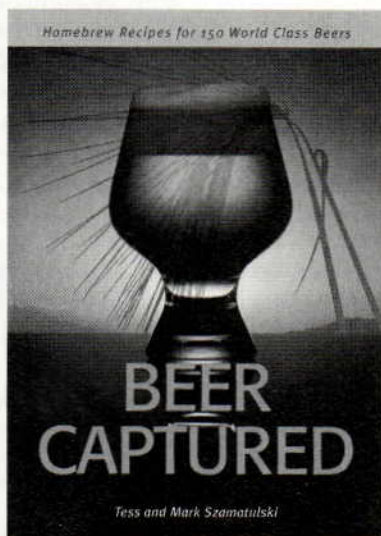
Dwight Frye  
El Cerrito, California

The authors of CLONEBREWS have done it again!

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## Why Dry?

Three views on how and why to dry-hop your beer

by Thomas J. Miller

**A**re you a hophead? Then you should try dry-hopping. It's a great way to boost the flavor and aroma of hops in your beer without adding bitterness.

There are several simple methods. You can simply toss whole or pellet hops into the fermenter, or you can use a hop bag.

A hop bag is usually made of mesh with a drawstring. Before racking your beer to a secondary container, put a half to one ounce of whole leaf hops in a bag, then secure it in the secondary container to keep it submerged. Now rack the beer on top of the hops and allow it to condition for ten days. Then rack again and let it settle for another week before bottling.

For more tips and techniques, we turned to a few professionals.



**Brewer:** John Tully is a brewer at Lakefront Brewery in Milwaukee, Wisconsin. He started brewing in 1995 and completed the Siebel Institute "Professional Brewers Course" in 1996.

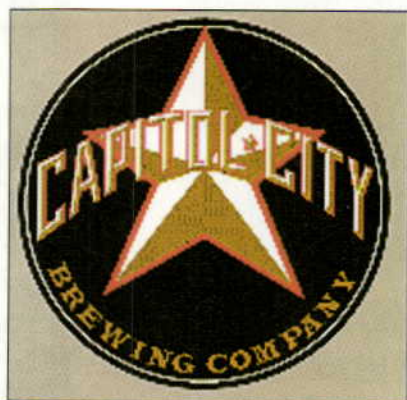
**D**ry hops are a nice addition to any beer. Since you lose a lot of the aroma and flavor characteristics of hops during the boil, if you want some hoppiness in your brew, dry-hopping is an excellent way to get it.

When we dry-hop, we use 3 ounces per 31 gallons (which translates into about 1/2 ounce for 5 gallons). We use pellets and just dump them into the empty secondary fer-

menter. Then we open up the lines and let the beer pour into the secondary. When they get wet, the pellets dissipate and spread throughout the beer. Usually they settle faster than the yeast, so when we draw the beer away for filtration, most of the hops are trapped beneath a layer of yeast.

Since we filter our beer, this method works well for us. Whole hops might be a better choice for homebrewers because pellets can remain in solution and find their way into your final brew.

My biggest advice for homebrewers is always to be sanitary. Soak your empty hop bag in a cleaning and disinfecting solution before placing the hops in it and racking your beer over to it. I have never heard of an instance where beer was contaminated by dry hopping, but it pays to be cautious.



**Brewer:** Chris Frashier has been head brewer at Capitol City in Washington D.C. for the past three years. He started out in college, making homebrew with a friend.

**W**hen we dry-hop, we usually have one goal in mind: to add the flavor

and aroma of hops to our beer without extracting the bitterness.

There are several styles at our brewery that call for dry hopping. We dry-hop our pilsner by adding Saaz hops. We also do it in our IPA, usually adding East Kent Goldings, and our American pale ale gets Cascade hops. The best thing to do is get large hop sacks, which are made of thinly woven material, like cheesecloth, then weigh out your hops, stick them in the sack and secure them in the fermenter. We tie our hop bag to the temperature gauge near the bottom of the fermenter. This keeps it from floating to the top during conditioning. If we didn't secure the sack during dry hopping, some of the hops would stay dry and this would prevent us from getting the full benefit of all the hops. Tying them down in the fermenter is a good way to make sure all the hops get saturated.

We let the beer condition with the hops for 10 to 14 days. We have found that racking off the hops earlier than 10 days prevents us from getting the kind of enhanced flavor that we want in our beers. Going longer than two weeks seems to have the opposite effect. The hops can overpower the brew and it starts to taste kind of like a hop tea. So it's important that you stick to an exact schedule.

Speaking of hop tea, that overwhelming flavor is one excellent reason to use whole leaf hops instead of hop pellets. Brewers will always argue endlessly over this, but I have found that when you do a comparative taste test, pellets always lose to whole leaf hops. Pellets have an "in-your-face" kind of character. Whole leaf hops, by comparison, produce a very well-rounded taste and really add a pleasant flavor to beer.



**Brewer:** Elis Owens is a brewer at Flying Dog Brewery in Denver, Colorado. He holds a bachelor's degree and a Ph.D. in microbiology, with a diploma in Brewing Science and Engineering from the American Brewers Guild.

I like beer to have a nice hop flavor and aroma. Hops create a smoother taste and a floral-type

flavor or spiciness in the final brew. Dry hopping gets hop aroma and flavor into the beer without imparting any extra bitterness.

There are all kinds of beer that are perfect for dry-hopping. Homebrewers should experiment. Some of the classic styles are IPA, ESB and ordinary English bitter. A different beer to try is a German Kölsch. Kölsch tends to be mild and can benefit from the extra taste that dry hopping gives. If you like "Winter Warmer" beers, dry hopping can add a spicy flavor that complements the other ingredients.

For English beers, you can recreate the style if you use classic English hops for dry-hopping. East Kent Goldings and Fuggles both have an earthy flavor that deepens the complexity of the brew. A lesser-known hop is English Northdown. It's similar to the other two, but a really nice alternative.

If you decide to dry-hop your

Kölsch, go with a standard German noble hop, like Hallertau. You want the hops to be subtle.

There is no scientific method to how much hops to add. With new recipes, we experiment with different amounts. For homebrewers I'd suggest starting with 1 to 2 ounces in five gallons. Then adjust future batches depending on your taste.

I recommend throwing the pellets or whole hops right in your beer at the end of fermentation. Don't bicker over pellets or whole hops, either. They both work great! Toss the hops in when fermentation is done; don't even rack first. Let the beer sit for six days and then rack off. Make sure you get six days. That's when most of the hop effect will occur. ■

*Tom Miller is an avid homebrewer who has worked as a professional brewer in Jackson Hole, Wyoming. He lives near Buffalo, New York.*

## BREW POTS

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## The Home Brewery

CIRCLE 22 ON READER SERVICE CARD

# "Help Me, Mr. Wizard"

## Oops, Forgot the Hops

Isomerized hop extracts, oven mashing and clear beer

Mr. Wizard

**I** brewed on a Saturday. It was a perfect brew day and everything was going great! Or so I thought. Three hours later it occurred to me that I didn't add the hops to the wort. I rushed to my fermenter and threw in one ounce of Cascade. Was this all right or is my perfect brew a wash? It was a Sam Adams duplicate.

Dan Belmore  
Via e-mail

There is not much great news to report on this unfortunate oversight. Hops need to be boiled to convert the insoluble alpha-acids into the soluble iso-alpha-acids. Unless the alpha-acids are "isomerized" during boiling, they will not impart bitterness to beer. Now, if you had added the first hop addition and later forgot to add the aroma hops, then dry hopping in the fermenter would certainly be a viable back-up plan. But unfortunately you forgot the hops entirely.

The hop addition is the most anxiously awaited part of the brew day because of the wonderful aroma that gently wafts from the kettle. I think one of the reasons so many homebrewers and microbrewers make really hoppy beers is so they can intensify the smell of the herb during boiling. So explain again: How the heck could you forget to add the hops? I'm pretty forgiving when it comes to mistakes, but you really opened yourself up to some friendly ribbing with this question!

If you have the appropriate supplies and tools you can correct your mistake after fermentation by adding a pre-isomerized hop extract

to your beer. Some large brewers use pre-isomerized hop extracts for bittering and add them either to the kettle or to the beer after fermentation. Most add them after fermentation to minimize losses. Hop losses occur during fermentation when the bittering compounds stick to yeast cell walls and get lost when the sediment falls to the bottom.

Some homebrew supply stores sell these compounds, but use them carefully because they are usually very concentrated and it's easy to add too much, which can give you "bitter beer face" in a matter of seconds! If you find a pre-isomerized extract that is very concentrated you can dilute it with a neutral grain spirit like vodka to make it easier to measure out.

By the way, the next time you brew your Sam Adams Boston Lager recipe, try dry hopping with Hallertau Mittelfrüh. That's the variety Boston Beer uses to get that intense, hoppy nose.

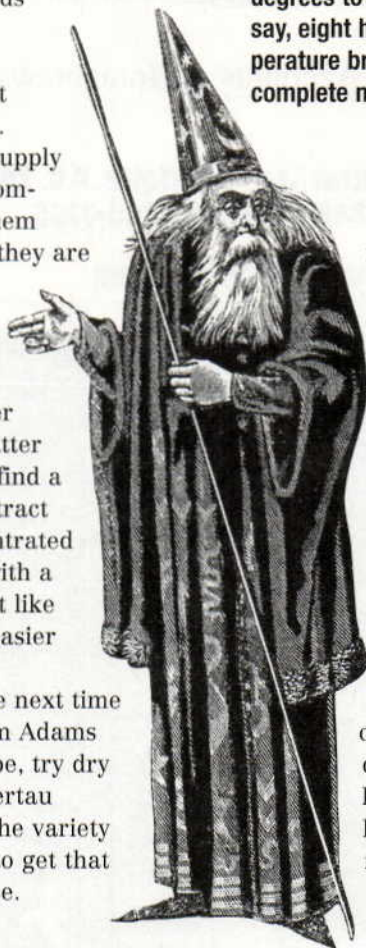
Mr. Wizard

**I have been brewing for about seven years. I started with kits, which gave me the confidence to move on to the all-grain brewing process. So far, all of my batches have been drinkable with no major mishaps.**

**Here's something I have been pondering: Would it be possible to mix**

**your grains with cold water, then put them in the oven at 150 degrees and leave it overnight? A friend of mine did this and it didn't convert. Do you have an idea why not? Also, is it possible to get too much tannin out of the husk with this method? If it goes from 100 degrees to 150 degrees in a period of say, eight hours, wouldn't all the temperature breaks be covered, to make a complete mash?**

Tom Geib  
Cambridge, Ohio



The oven-mash method can be effective. A very slow increase from 100° to 150° F will give all mash enzymes an opportunity to convert the starches in malted barley into fermentable sugars. But the problem with such a long, slow temperature increase is that the wort may turn out to be too fermentable and will result in a very dry beer. This is how some commercial brewers produce light and dry beers. For example, Anheuser-Busch uses a very long rest (about 3 hours) at around 140° F to make Bud Light. This is the optimal temperature for

beta-amylase activity. Extending this rest, coupled with a slow increase to 150° to 158° F for conversion, results in a highly fermentable wort.

I would set my oven at about 162° F to get a slightly higher conversion temperature of about 156° to 158° F. Setting the temperature a bit higher than your target will

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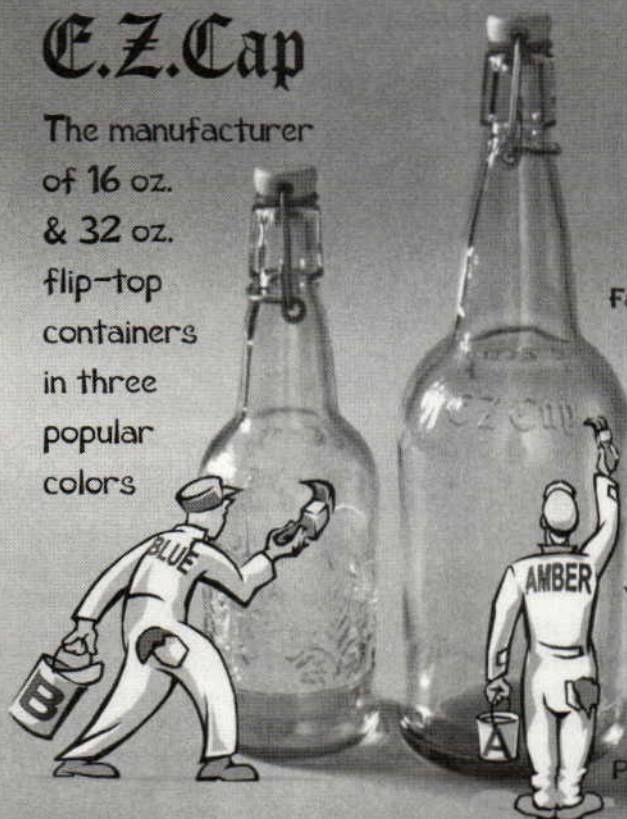
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**Mr. Wizard**

assure the mash makes it up to temperature. Since the rate of temperature change decreases as the air temperature and mash temperature get closer, it could take a long time to hit your target temperature. Remember that thermometers and thermostats require calibration. My guess is that your friend's oven is out of calibration. This is a common problem with household ovens. If you want to give the oven-mash method a try, you should begin by calibrating your oven with a calibrated thermometer.

The easiest way to calibrate a bi-metallic thermometer (the most common type of household food thermometer) is to make an ice bath. The temperature of an equilibrated mixture of ice and water resulting from the ice melting is 32° F. If the thermometer does not read 32° F, you can calibrate by using its calibration screw or turning the dial. After checking it on the low end, boil some water and check the boiling point. The boiling point of water should be around 212° F. If it's not exactly 212° F, don't worry because boiling point is affected by altitude and atmospheric pressure. Once you know your thermometer is accurate, check the oven dial thermometer against it.

I have never gotten around to trying this method myself. However, I have used a variation on the theme. When I first started homebrewing, I used to mash in a big kitchen pot and would stick the pot in a pre-heated oven to prevent the grains from cooling off during the mash. Your method would be handy if you were staying up late on Friday tasting some good brews. You could mix up your mash, toss it in the oven and get up the next day and finish brewing by noon.

**Mr. Wizard**

I have been "full mash" brewing for several years now. A friend and I planted some English hops. They are thriving and will soon be ready for harvest. Can I use fresh hops or do I have to dry them out first? If I can use

**fresh hops, what are the proportions I should use (for one pound of dried hops, how many pounds of fresh hops should I substitute?)**

*Eric Greenwood  
Via e-mail*

Fresh, unkilned hops can certainly be used in beer and there is no right or wrong way to use them. I think fresh or "green" hops are best for late-hopping because of the great aroma they impart. They also contain a lot of moisture (about 80 percent) and you would have to use a huge amount for bittering.

The first green-hop beer I ever tasted was a beer brewed by Sierra Nevada called Harvest Ale. It had an intoxicating hop aroma that smelled completely different from a hoppy brew made using kilned hops. The beer itself was pretty intoxicating, too. Its original gravity was around 1.068 but it was so smooth and tasty I thought it was a

normal-gravity beer. Oh well!

The key to using fresh hops is to use them immediately after harvesting. Sierra's Harvest Ale was brewed by coordinating the shipment of hops from the hop field directly to the brewery using an overnight express freight service. Grant's in Yakima also makes a beer with fresh hops. Their hop delivery is easy to coordinate since Yakima is in the heart of Washington hop territory.

I have brewed a fresh hop ale for the last two years. The first year, I added about one pound of fresh hops per barrel of wort (31 gallons) right at the end of the boil and got a nice, fresh, hop character. The aroma has a pungent grassy note, kind of like fresh-cut hay. The second year the hop yield was not so great, so I decided to dry hop with the green hops. This time I added two pounds of green hops to one barrel of pale ale. It went from fair-

ly hoppy in the nose to super hoppy! I drank a bottle just the other day; the nose was still intense and the flavor was delicious.

Don't substitute fresh hops for kilned hops in a recipe. I would use the fresh hops for aroma at a fairly heavy-handed rate, keeping in mind that they have a lot of extra weight because they are moist. I have used 3 ounces per 5 gallons with nice results. If your hops are good quality and are used when fresh, you won't be disappointed!

**Mr. Wizard**

**I've been trying to brew a batch of "clear beer" by using very blond malt and a rice extract. So far the results are not as promising as I would like. I'm looking for any suggestions you might have on how to get as little color as possible.**

*Robert Gill  
Via e-mail*

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## Mr. Wizard

Clear beers are one of the great products made possible by advances in brewing science and technology. And you're on the right track if you brew a high-adjunct wort using rice syrup. After all, the quintessential clear beer is sake, which is made solely with rice. Sake brewers can use rice alone because the fungus *Aspergillus oryzae* converts the starch in the rice into fermentable sugars. The resulting mixture of *Aspergillus oryzae* and rice starch is called koji. Yeast is then used to ferment the koji into sake.

If you want to make a clear beer using malt as one of your ingredients you must remove the color, since even the palest malts contribute some color to wort. After the beer has been filtered with a conventional filter to remove yeast, the standard practice is to remove color using carbon filtration. Carbon filtration is a very effective method used to remove all sorts of organic compounds from compressed gas and water. It also is good at removing color from beer — along with flavor. Remember Jack Daniel's whiskey is charcoal filtered prior to aging (whiskey is colorless before going into barrels) and this charcoal filtration is purported to make JD a very smooth whiskey.

I have never personally used charcoal filtration to remove beer color but I understand that it's relatively simple. You can buy charcoal filter elements at stores that sell home water purification equipment. These devices will filter out the wide variety of organic compounds that give color to your beer.

Clear malts are usually unhopped beverages and are used as the base for a wide range of traditional tipples, like malt-based coolers, hard lemonades, orange-ades, berry-ades, hard iced teas and, my personal favorite, Zima. All of these beverages are taxed just like beer, which is in the lowest tax bracket of any alcoholic beverage produced in the United States. Your project sounds fun. Let us know how things turn out!

## Mr. Wizard

I am a new homebrewer and have been having trouble finding information on mash water temperature.

Most recipes state something like this: Heat the mash water to 170° F and add the grains to the mash water. The water should settle at 155° F. This should work if I use the same amounts of grain and water that the recipe states. I prefer to use a thinner mash than most recipes call for. Simple thermodynamics indicate that if I change either the amount of water or grains, the initial water temperature should change in order to achieve the same mash temperature.

I have not been able to find a formula to calculate the appropriate initial water temperature required. Shouldn't it take into account the weight of the grain and water, as well as the temperature of the grain (room temperature) and the final mash temperature required? I hope that you can clarify this for me.

Curtis Jensen  
Via e-mail

This is a good question with an elusive answer. The formula I use to solve this problem is based on a straightforward energy balance. The formula reads:  $(M C_p \Delta T)_{\text{water}} = (M C_p \Delta T)_{\text{malt}}$ , where: M is mass (kilograms),  $C_p$  is specific heat (kilo Joules/kilogram\*Kelvin) and  $\Delta T$  is change in temperature (Kelvin).

Kelvin equals ° Celsius + 273 so  $\Delta T$  is the same number whether temperature is expressed in Celsius or Kelvin; in other words, simply use Celsius. Specific heat is calculated by the the amount of energy required to change the temperature of a kilogram of something 1 degree Kelvin (or Celsius). The specific heat of water is 4.2. The specific heat of malt is around 1.8.

A nice brewer's number is the liquor-to-grist ratio or L:G. The L:G relates the mass of water in a mash to the mass of malt. For example, a mash with 10 kilograms of malt and a L:G of 3 contains 30 kilograms of

mash water. Since this formula is metric you must use kilograms, which is convenient since 1 kilogram of water is the same as 1 liter. L:G makes a convenient substitution in the formula and the result looks like the following:

$$(L:G)(C_p \Delta T)_{\text{water}} = (C_p \Delta T)_{\text{malt}}$$

Now it's time for for an example. Suppose you are brewing a

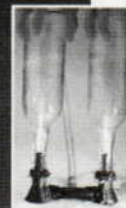
batch of beer that requires 6 kilograms of malt and the initial mash temperature is supposed to be 152° F. The two questions are: how much water do you use and at what temperature? You said you like a thinner mash and a L:G of 3.25 will give you a fairly thin mash. So the first answer is 19.5 liters of mash water (6 kilograms of malt multiplied by 3.25 kilograms water per kilogram

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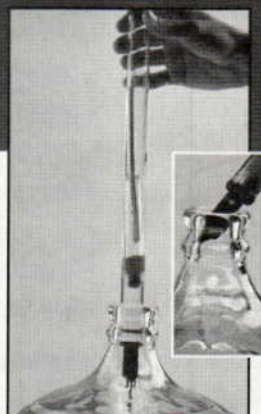
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## Mr. Wizard

of malt). The second answer requires measuring the malt temperature. If the malt has been stored in the house, it's pretty safe to assume it's at room temperature; I'll assume room temperature is 22° C or 71.6° F. The conversion from ° F to ° C is: ° F = (° C\*9/5) +32. So now for the calculation:

$$(L:G)(Cp_t)_{\text{water}} = (Cp_t)_{\text{malt}}$$

$$(3.25)(4.2)(x-67) = (1.8)(67-22)$$

The (x-67) is used to express the temperature change in water as it starts at some temperature "x" and drops to the mash temperature of 67° C or 152° F.

$$x = \{(1.8)(45) \div (3.25)(4.2)\} + 67$$

$$x = \{81 \div 13.65\} + 67$$

$$x = 5.93 + 67$$

$$x = 72.93^\circ \text{ C or } 163.27^\circ \text{ F.}$$

This formula works very well and is easy to use once you give it some practice. It's important to recognize that the formula assumes no energy loss to the environment; i.e., the mash tun. Calculating energy loss to the system is difficult and most brewers, especially brewers using stainless or copper mash vessels that can really cool off a mash, pre-heat their mash vessel. Another factor this formula does not account for is the "slaking heat" or the energy of hydration (wetting dry malt). Slaking heat varies with moisture content; most malts today have a fairly consistent moisture content and the slaking heat gets buried into the specific heat number. This works fine if you use malts with about the same moisture content.

Once you get comfortable using this formula you may feel like the calculated temperature is a bit off. The easiest way to "tweak" the formula is to back-calculate the actual specific heat of the malt. This number varies with moisture content and the number 1.8 is not exact, however it works for me.

An old rule of thumb says to add 12° F to your target mash temperature assuming your L:G is 3 and your malt is at 68° F (20° C). Rework the above example using a L:G of 3 instead of 3.25 and see if the rule of thumb and the energy balance agree with one another. ■

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



Do you have a question for the all-knowing Mr. Wizard? Write to him at *Brew Your Own*, 5053 Main Street, Suite A, Manchester Center, VT 05255. Or send an e-mail to [wiz@byo.com](mailto:wiz@byo.com). If you submit your question by e-mail, please include your full name and hometown.



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## The Replicator

Red Tail Ale from the Mendocino Brewery

by Scott R. Russell



### Dear Replicator:

I've really enjoyed the beers from the Mendocino Brewery in Hopland, California. I like the artwork on the labels and I love the taste of the beer. Can you tell me how to clone Red Tail Ale? I also enjoy their Blue Heron Ale and Eye of the Hawk. Thanks.

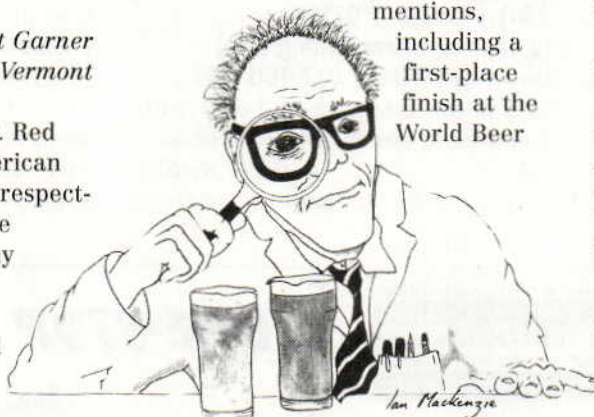
Walt Garner  
Brookfield, Vermont

**Y**ou've hit on a classic. Red Tail is a reliable American Pale Ale from a well-respected and growing brewery. The Mendocino Brewing Company opened in 1983 in Hopland, California. As the name implies, Hopland was indeed a hop-farming region from

the 1850s through the late 1940s. Founded by two avid homebrewers, Mendocino Brewery was one of the first modern-day microbreweries to open in the state of California.

Initially just a locally appreciated beer, Red Tail Ale has since won numerous awards and honorable

mentions, including a first-place finish at the World Beer



Championships in 1997. A few years back, the MBC expanded to a second location in Ukiah and just recently bought the Ten Springs Brewery in Saratoga Springs, New York. They are now brewing and supplying on both coasts. The company also makes one of my very favorite stouts, Blackhawk Stout.

Red Tail is billed as "a full-bodied amber ale." It boasts a big, creamy, off-white head and a lot of Cascade aroma. The flavor is full and balanced between the hops (Cascade for flavor, Cluster for bitterness), with a big caramel and toasty profile.

For more information on the brewery and its beers, call (707) 744-1015 or go to its Website at [www.mendobrew.com](http://www.mendobrew.com).

### Red Tail Ale

(5 gallons, extract with specialty grain)

OG = 1.052 FG = 1.016 IBUs = 28 to 30

#### Ingredients

- 1 lb. caramel malt (60° Lovibond)
- 0.5 lb. toasted pale malt (toast the malt on a cookie sheet for 30 min. at 350° F)
- 3 lbs. Briess unhopped amber dried malt extract (DME)
- 2 lbs. Briess unhopped light DME
- 4 AAU Cluster hop pellets (1/2 oz. of 8% alpha acid)
- 4 AAU Cascade hop pellets (1 oz. of 4% alpha acid)
- 1 oz. whole Cascade hops
- American ale yeast (Wyeast 1056 or White Labs WLP-001)
- 1 cup Briess unhopped light dried malt extract (DME)

#### Step by Step

Steep caramel and toasted malts in 3 gallons water at 150° F for 30 minutes. Remove grains, add DME, bring to boil. Add Cluster hops, boil 30 minutes. Add Cascade pellets, boil 30 minutes. Turn off heat, add whole Cascade hops (in hop bag), steep 30 minutes and remove. Put wort into your primary fermenter along with enough chilled, pre-boiled water to make 5.25 gallons. When cooled to 70° F, pitch yeast. Ferment warm (68 to 70° F) for ten days, rack to secondary and condition cooler (64° F) for two weeks. Prime with 1 cup unhopped, light DME. Bottle and age two to three weeks.

**Partial mash option:** Mash 3 lbs. pale malt, plus the caramel and toasted malt as above, in 2 gallons water at 152° F for 90 minutes. Runoff and sparge with 2 gallons at 170° F. Decrease the DME to 2 pounds amber and 1 pound light. Proceed as above from boiling.

**All-grain option:** Mash 7.5 lbs. pale malt, plus the caramel and toasted malts as above, in 3 gallons water at 152° F for 90 minutes. Runoff and sparge with 4 gallons. Omit DME (except for priming) and proceed as above, from boiling. You should not need to top up the wort in the fermenter, but time your boil and hop additions to end up with 5.25 gallons in the kettle.

## Celebration Ale

(5 gallon, extract with grains)  
OG = 1.064 FG = 1.014 IBU = 50

I love Sierra Nevada Celebration Ale. To perfect this homebrew version, I exchanged e-mails with the brewmaster at Sierra Nevada!

*Daniel Gestwick  
Williamsville, New York*

### Ingredients

- 6 lbs. unhopped light Muntons DME
- 1 lb. carapils dextrin malt  
(3° Lovibond)
- 1 lb. two-row pale malt  
(4° Lovibond)
- 1 lb. caramel malt (20° Lovibond)
- 10.5 AAU of Chinook hop pellets  
(1 oz. at 10.5% alpha acid)
- 20 AAU of Cascade hop pellets  
(5 oz. at 4% alpha acid)
- 15 AAU of Centennial hop pellets  
(2 oz. at 7.5% alpha acid)
- 1 pt. starter of American Ale yeast  
(Wyeast 1056)
- 1 tsp. Irish moss
- 3/4 cup corn sugar (for priming)

### Step by Step

Steep grain malts in 2.5 gallons water at 150° F for 45 minutes. Remove and add DME. Bring to boil. Add Chinook and boil 40 minutes. Add 1 oz. Cascade, boil 10 minutes. Add 1 tsp. Irish moss. Add 1 oz. Cascade and boil 5 minutes. Add 1 oz. Cascade, boil 5 minutes more and turn off heat. Add 1 oz. Cascade and 1 oz. Centennial while wort cools (30 minutes). Transfer to fermenter, top up to 5.25 gallons, cool to 68° F and pitch yeast. Ferment at 68° F for 5 to 7 days. Rack to secondary. Dry-hop with Cascade and Centennial. Condition 2 weeks. Prime with sugar and bottle. Age two to three weeks.

## Ten Pound Porter

(5 gallons, extract with grains)  
OG = 1.055 FG = 1.017 IBU = 55

This porter is smooth and dark with a chocolate aroma and a big head.

*David Redlich  
Benton, Arkansas*

### Ingredients

- 10 lbs. dark malt extract syrup
- 0.5 lb. chocolate malt
- 5 AAU Cascade whole hops  
(1.25 oz. of 4% alpha acid)
- 9 AAU Northern Brewer hop pellets  
(1 oz. of 9% alpha acid)
- 2.5 AAU Tettnang whole hops  
(0.5 oz. of 5% alpha acid)
- London Ale yeast (Wyeast 1318)

### Step by Step

Steep grains in grain bag in 4 gal. of water for 20 min. Remove when temperature reaches 170° F and bring to a boil. Add extract and return to boil. Add Cascade and Northern Brewer hops, boil 60 min. Add Tettnang hops and turn off heat. Remove all hops after 5 min. Cool and transfer. Add preboiled, cooled water to bring up to 5 gal. Pitch yeast and ferment for 1 week at 60° F. Rack to secondary and ferment for 3 weeks. Rack to soda keg and carbonate with CO<sub>2</sub>. Ready to drink when chilled. ■

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## ESB and Weizenbock

An old English standard and a complex German hybrid

by Tess and Mark Szamatulski



**S**WEATER WEATHER IS HERE, a premonition of the cold months to come. To homebrewers this means it's time to brew some bigger beers to keep us warm until spring. This month, we'll be brewing an appealing, malty strong bitter and a complex, powerful weizenbock. Both of these styles are ales, so you should be drinking them before the snow falls.

### ESB: An English Standard

Strong Bitter is the English term for a warming, well-hopped ale. The example we have chosen to brew is a recipe from our new book, "Beer Captured" (Maltose Press). It's modeled after Young's Special London Ale from the Young and Company Brewery in London, England. This muscular brew has an off-white, chunky head, with hints of light amber and crystal malt to come. The aroma is well-integrated, with a malty nose and spicy English hops. It has a malty palate, slightly

sweet with a perfect blend of hops and a complex finish that lingers.

ESB or Strong Bitter Pale Ale falls within these official style guidelines: the original gravity is between 1.046 to 1.065; the final gravity ranges from 1.011 to 1.020; bitterness runs from 30 to 65 IBUs; and the color is between 6 and 14 SRM.

One of the most famous examples of an English strong bitter is Fullers ESB. In Lancaster, the Mitchells brew an ESB that's a northern version of Fullers. Some others that aren't as well known but are worth trying are Bateman's XXXB, Ushers 1824 Particular Ale, Shepherd Neame Bishop's Finger and Royal Oak.

In some parts of England, an ESB is titled Super Premium Bitter. It's a broad field where hop aroma can range from high to none and diacetyl and carmel aroma from moderate to none. There should be moderate fruitiness and the malt aroma should be apparent. The

color can range from copper to dark-amber brown. The malt flavor should be the most apparent aspect of the palate. The bitterness range can be from moderate to quite bitter but it shouldn't overtake the malt. There should be a slight warming from alcohol, but it should never be overpowering.

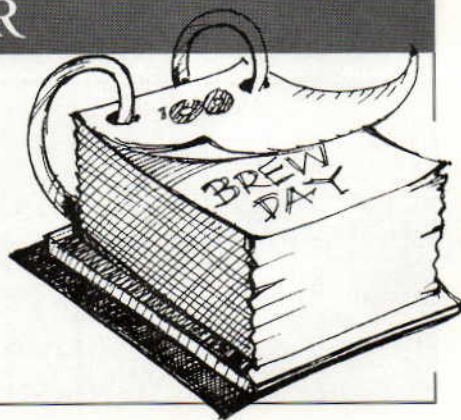
Classic English hops — Fuggles and East Kent Goldings — are used to balance the malt, with Goldings often used for both aroma and flavor. Some other popular hops for this style are Target, Challenger and Whitbread Goldings. Crystal malt is used for character and a rounded sweetness with torrified wheat contributing to the body and giving the beer a rich creaminess. Torrified wheat is heated at high temperatures, which cause it to expand and makes it easier to mash.

When using Wyeast 1968 Special London yeast, it is imperative to oxygenate the wort. This yeast in particular needs a high

## THE YEAR IN BEER

**JANUARY:**  
Barleywine & Roggenbier  
**FEBRUARY:**  
Cream Ale & Dublin Stout  
**MARCH:**  
Belgian Dubbel & Pilsner  
**APRIL:**  
Maibock & Scotch Ale  
**MAY:**  
IPA & Mild Ale

**JUNE:**  
Golden Ale & Oktoberfest  
**SEPTEMBER:**  
Dort & Oatmeal Stout  
**OCTOBER:**  
ESB & Weizenbock  
**NOVEMBER:**  
Dunkel & Belgian Tripel  
**DECEMBER:**  
Christmas Ale & Spiced Ale



amount of oxygen to ferment the wort quickly. We also advise using an XL pack or making a large starter, along with oxygenating.

Serve this ale in a pint glass at 50° F with a grilled-steak sandwich, English thick-cut fries and a porcini mushroom and ESB gravy.

**Young's Special London Ale**  
(5 gallons, extract with grains)  
OG = 1.056 FG = 1.016 IBU = 50

### Ingredients

- 9 oz. Muntons crystal malt (55° Lovibond)
- 6 oz. British torrified wheat malt
- 2 lbs. Muntons extra light dry malt extract
- 6.6 lbs. Muntons extra light malt syrup
- 7 AAU English Fuggles hops (1.5 oz. at 4.7% alpha acid)
- 7 AAU East Kent Goldings hops (1.5 oz. at 4.7% alpha acid)

- 1 tsp. Irish Moss
- 4.7 AAU East Kent Goldings hops (1 oz. at 4.7% alpha acid)
- 4.7 AAU East Kent Goldings hops (1 oz. at 4.7% alpha acid)
- Special London (Wyeast 1968) or White Labs English Ale (WLP-002)
- 1.25 cups Muntons light dry malt extract for priming

### Step by step

Bring one gallon of water to 155° F, add crushed grain and hold for 30 minutes at 150° F. Strain the grain into the brewpot and sparge with one gallon of 170° F water. Add the dry malt and malt syrup, plus Fuggles and first East Kent Goldings. Bring the volume in the brewpot to 2.5 gallons. Boil for 45 minutes, then add second Kent Goldings and Irish moss. Boil for 13 minutes, add final Kent Goldings. Boil for 2 minutes, then remove pot


from stove. Cool wort for 15 minutes in an ice bath or chill it with a wort chiller.

Strain into the primary fermenter and add water to reach 5-1/8 gallons. Add yeast when wort has cooled below 80° F. Aerate well. Ferment at 68 to 72° F for 5 to 7 days. Rack into secondary (glass carboy). Ferment until target gravity has been reached and beer has cleared (approximately 3 weeks). Prime and bottle. Carbonate at 70 to 72° F for 3 weeks. Store at cellar temperature.

### Partial mash with grain option:

Mash 2-1/3 lb. Muntons two-row pale malt with the specialty grains in 1 gallon water at 150° F for 90 minutes. Sparge with 2 gallons water at 168° F. Then follow the extract recipe, omitting the 2 lbs. of Muntons extra light dry malt extract from the boil.

## October 2000

S	M	T	W	THURSDAY	F	SATURDAY
I	2	3	4	<b>PREP DAY</b> • Assemble all ingredients for Weizenbock • Start yeast culture for brewing on Saturday	5	<b>BREW DAY</b> • Brew Weizenbock • Record original gravity • Ferment in primary for 7 days • Oatmeal Stout ready today
8	9	10	11	<b>PREP DAY</b> • Assemble all ingredients for ESB • Start yeast culture for brewing on Saturday	12	<b>BREW AND TRANSFER DAY</b> • Brew ESB and record original gravity • Ferment in primary for 5 days • Rack weizenbock to secondary • Continue fermenting for 5 more weeks, then prime and bottle if FG is reached
15	16	17	18		19	<b>TRANSFER DAY</b> • Rack ESB to secondary • Continue fermenting three more weeks, then prime and bottle or keg if FG is reached
22	23	24	25		26	27
29	30	31				

### All-grain option:

Mash 1.75 lbs. Maris Otter two-row pale malt with the specialty grains in 3.25 gallons of water at 152° F for 90 minutes. Sparge with 5 gallons of water at 168° F. The total boil time is 120 minutes. Add 1.5 oz. East Kent Goldings (bittering hops) and 1.5 oz. Fuggles (bittering hops) for the last 90 minutes of the boil. Add the flavor hops and Irish moss for the last 15 minutes of the boil and add the aroma hops for the last 2 minutes of the boil.

### Weizenbock: A German hybrid

Man does not live by bread alone, nor does he brew beer with barley alone, so let's brew a weizenbock! A weizenbock is a hybrid beer, capturing the best qualities from a German weizen (wheat) beer and a German bock. If you enjoy both of these styles of beer, you're in luck: Never before have two beer styles collided so successfully. The weizen contributes to a creamy, huge head and sharp fruitiness, with notes of cloves and wheat in the aroma and on the palate, along with a cloudiness from the yeast. The rich, malt aroma and taste, with warming alcohol and sweetness, are derived from the bock side of the brew.

The weizenbock we are brewing has a perfect balance of the two complex flavor profiles. The color is a rich amber and the huge, light-beige head entices the nose with luscious malt and ripe fruit. The palate is lively, full-bodied and warms the tongue. There are nuances of spices, ripe fruit and chocolate in the flavor, leading to a "clovelike" finish.

The guidelines for weizenbock are as follows: original gravity is between 1.066 and 1.080; final gravity should be between 1.015 and 1.022; bitterness ranges from 15 and 30 IBUs; and color falls between 7 and 25 SRM.

The most well-known example is Aventinus, the oldest top-fermenting wheat doppelbock. It was first brewed in 1907 in Munich,

Germany by the famous Schneider family. This is an extremely flavorful version, on the high side of the style guidelines, weighing in at 7.7 percent ABV. It's a dangerously drinkable beer, complex and well-balanced. Another German example is the Pikantus brewed by Erdinger brewery, the biggest producer of wheat beer in Germany. In the

United States, Pyramid Brewing in Washington state brews a nice domestic version of a Weizenbock (Pyramid Wheaten Bock).

Traditionally, the hops of choice for a weizenbock are German noble hops, most commonly German Hallertau. It's brewed from European malts, with at least 50 percent being wheat malt. The



The advertisement is enclosed in a rectangular border. At the top, two pairs of bells are positioned on either side of the text "NEXT TIME SHE ASKS YOU TO BREW SOMETHING FOR HER...". Below this, a man and a woman are shown in profile, looking thoughtful. Above the man is a thought bubble containing a glass of beer, and above the woman is a thought bubble containing a glass of wine. Below the couple, the text reads "DO YOU REALLY THINK SHE WANTS A STOUT?" followed by "SURPRISE HER WITH A WHITE ZINFANDEL... OR A CABERNET... OR A CHARDONNAY...". At the bottom left is a circular logo for "BREW KING" with a crown and wheat. To the right of the logo is the text "EXCEPTIONAL WINE KITS!" in a bold, sans-serif font, with the word "Selection" written in a cursive script to its right. Below this is the website "WWW.MAKEWINENOW.COM" and the text "OR [WHOLESALE ONLY] STEINBART WHOLESALE 503-281-3941".

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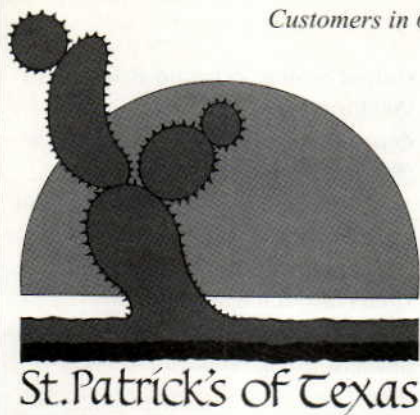
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## StyLe calendar

other malts contribute to the flavor, maltiness and color. The yeast is a traditional German weizen yeast which provides the clean, slightly sharp clove and vanilla notes. The yeast must be a bold strain so as not to be overpowered by the big malt and alcohol presence.

Serve the weizenbock in a traditional wheat beer glass, or if you can obtain it, the beautiful and unique Aventinus glass at 50° F with a slice of German Black Forest cake, sweet cherries and a dollop of freshly whipped cream.

### Weizenbock

(5 gallons, extract with grains)  
OG = 1.078 FG = 1.016 IBUs = 15

### Ingredients

8 oz. Belgian cara-Munich malt

6 oz. German crystal malt  
(65° Lovibond)

1 oz. British chocolate malt

8.75 lbs. Muntons wheat  
dry malt extract

4 AAU Tettnanger hops

(1 oz. at 4% alpha acid  
for bittering)

1 tsp. Irish moss for 15 minutes

2 AAU German Hallertauer

Hersbrucker hops (0.5 oz. at  
4% alpha acid for flavor)

Bavarian Wheat (Wyeast 3056) or  
Hefe-Weizen yeast (White Labs  
WLP300)

1-1/4 cups Muntons wheat

dry malt extract for priming

### Step by step

Bring one gallon of water to 155° F, add crushed grain and hold for 30 minutes at 150° F. Strain the grain into the brewpot and sparge with one gallon of 170° F water. Add the dry malt and bittering hops. Bring the total volume in the brewpot to 3.5 gallons. Boil for 45 minutes then add the flavor hops and Irish moss. Boil for 15 minutes then remove pot from stove.

Cool wort for 15 minutes in an ice bath or chill with wort chiller. Strain into the primary fermenter and add water to reach 5-1/8 gallons. Add yeast when wort has



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cooled to below 80° F. Oxygenate-aerate well. Ferment at 68° F for 5 to 7 days. Rack into secondary (glass carboy). Ferment at 68° F until target gravity has been reached and beer has cleared (approximately 5 weeks). Prime and bottle. Carbonate at 70 to 72° F for 5 weeks. Store at cellar temperature.

#### Partial mash option:

Mash 1.25 lb. German 2-row pilsner malt, 1 lb. German wheat malt, 8 oz. Belgian cara-Munich malt, 6 oz. German dark crystal malt, 1 oz. British chocolate malt and 4 oz. rice or oat hulls in 1.25 gallons water at 150° F for 90 minutes. Sparge with 2 gallons water at 168° F. Then follow the extract recipe, omitting the 1.75 lbs. of Muntions wheat dry malt extract.

#### All grain option:

Mash 4.25 lb. German 2-row pilsner malt, 8.5 lb. German wheat malt, 6 oz. Belgian cara-Munich malt, 4 oz. German dark crystal malt, 1 oz. British chocolate malt and 12 oz. rice hulls or oat hulls in 4 gallons water at 148° F for 90 minutes. Sparge with 5 gallons water at 168° F.

The total boil time is approximately 150 minutes. Add 3.2 AAU of Tettnanger (bittering hop) for the last 90 minutes of the boil, add the flavor hops and Irish moss for the last 15 minutes of the boil.

If you do not have the capability to mash this amount of grain you can omit 3 lb. of German wheat malt and 2 lb. German pilsner malt from the mash and add 3 lb. Muntions wheat DME to the boil. You will then need only 2.5 gallons of water for the mash and 5 gallons of sparge water. This will also reduce your boil time to 90 minutes. ■

*Tess and Mark Szamatulski own Maltose Express in Monroe, Connecticut, the largest homebrew supply shop in the state. They're the authors of "Clonebrews" (Storey Books) and the upcoming "Beer Captured" (Maltose Press).*



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CIRCLE 35 ON READER SERVICE CARD

# WILD RICE WILD RICE WILD RICE



PHOTOGRAPHY BY BOB FIRTH

by JOE AND DENNIS FISHER

**T**HE THING TO REMEMBER ABOUT BREWING WITH WILD RICE," says Kirby Nelson of the Capital Brewing Company in Middleton, Wisconsin, "is that a little bit goes a long way." Kirby is the master brewer responsible for the annual production of Capital's renowned Wild Rice Lager, a decidedly unusual seasonal beer. It's a pilsner style, with few specialty malts to distract the taste-buds from the central ingredient. "I want the wild rice to be up front and center," he says. "Nothing else should get in the way."

Kirby is one of the pioneers of wild-rice brewing. He's been at it since the late 1980s, when he started at Capital as assistant brewmaster. A year later he was promoted to brewmaster, overseeing the creation of the company's fine lagers. About the same time, the James Page brewery in Minneapolis

started making two different kinds of wild rice beer. Today, James Page is generally credited with being the first commercial brewer to make a wild rice beverage.

Wild rice is not a traditional brewing ingredient. It was too rare and too pricey when other, cheaper grains were available. Just fifteen years ago, it was unknown even in the most elevated brewing circles. Even now, few breweries make it

and many homebrewers have never heard of it, let alone brewed a batch themselves. Nevertheless, in the past few years Midwestern breweries have won a number of awards for wild rice brews, so things are looking up for those who prefer a touch of weirdness in their beer.

Wild rice beer almost qualifies as a regional specialty. The native grain grows best in the cold, deep running rivers of states like



# Make some truly unique homebrew with this indigenous Northwoods grain

Minnesota, Wisconsin and Michigan, and most breweries that make wild rice beers seem to be located in these Midwestern states.

Kirby Nelson is enthusiastic about his beer. "I like the warped nuttiness of it," he says. "It's a personal and cherished part of the

Capital lineup." So how does he make this seasonal speciality?

## CAPITAL STEPS: HOW NELSON MAKES WILD RICE LAGER

Kirby still uses the same formula he developed years ago. "It was my first experience brewing with adjuncts, so I wanted to get everything just right," he recalls. He uses a base of pale and Victory malt, with wild rice measuring about 10 to 20 percent of the total grain bill.

"Technically, it's not a pilsner," he says, because the alcohol content is too high and the beer is hopped with an IBU in the mid-20 range. The original gravity is 1.052 and the beer finishes at 1.011.

"As a non-malted ingredient," Kirby explains, "wild rice has to undergo a cereal mash. We're set up for upward infusion here, and I use a pretty hefty malt charge of 18.5 percent. I start with the malt at 122° F. After the protein rest, I

add the rice and then hold at 150° F for half an hour."

Next, Kirby brings the temperature up to 180° F and holds for ten minutes in a process known as "gelatinization." This step allows the rice to undergo the chemical processes that prepare it for conversion. He then boils the wild-rice mash for 20 to 30 minutes.

Meanwhile, the rest of the malts are cooking in a separate mash. The two mashes are then added together. Kirby uses about 25 IBUs of hops, a blend of Cascade, Cluster and Willamette. "The secret to wild rice brewing," Kirby says, "is to create an especially well-balanced product." This is particularly true when specialty malts are being added with such a light hand.

For a beer with so few extras, Wild Rice Lager is expensive to make, because wild rice is not cheap. Capital does an annual limited release around Thanksgiving,



PHOTOGRAPHY BY BOB FIRTH

*Native Americans traditionally harvested wild rice, an aquatic grass, by bending the stalks over the gunwales of their canoes and tapping the heads, causing the precious grains to fall. These days, most wild rice is grown in big commercial paddies. But the old-fashioned harvest is still practiced in places like the White Earth reservation in northwestern Minnesota.*

# WILD RICE RECIPE FILE

PHOTOGRAPHY BY BOB FIRTH



## Mad Fishmonger Wild Rice Ale

(5 gallons, all grain)  
OG = 1.041 FG = 1.011 IBU = 49

### Ingredients

4 lbs. lager malt  
1.25 lbs. mild malt  
0.75 lbs. wild rice  
0.5 lbs. Belgian malt  
6 oz. CaraHell malt  
2 oz. CaraMunich malt  
8 AAU of Kent Goldings hops  
(2 oz. of 4% alpha acid)  
2 AAU of Mt. Hood hops  
(0.5 oz. of 4% alpha acid)  
Wyeast 1968 (London Ale)  
2/3 cup corn sugar for priming

### Step by Step

Boil wild rice in 1 gallon water until gelatinous (45 min). Add malts to 1 gal. 130° F water, stabilize at 122° F and hold for 30 min.. Add rice mash and stabilize at 152° F for 30 min. Add 1 gal. 180° F water, stabilize at 158° F and hold 30 min. Raise to 170° F. Sparge with 4 gal. of 170° F water to collect 6 gal. Add Kent Goldings hops and boil 60 min. Turn off heat, add Mt. Hood hops and steep 5 min. Strain hops, cool to 68° F and pitch yeast. Ferment at 65° F.

## Hagbard's Wild Rice Vienna Lager

(5 gallons, partial mash)  
OG = 1.063 FG = 1.017 IBU = 51

### Ingredients

2 lbs. pale lager malt  
1-1/8 lbs. wild rice  
2.5 lbs. Munich malt  
0.25 lbs. German crystal malt  
(40° Lovibond)  
0.25 lbs. Cara-Pils malt  
0.25 lbs. Vienna malt  
2.2 lbs. Premier hopped  
malt extract  
3.3 lbs. Northwestern gold  
malt extract  
10 AAU of Hallertauer  
Hersbrucker hops (2.25 oz.  
of 4.4% alpha)  
2 AAU of Tettnanger hops  
(0.5 oz. of 4% alpha acid)  
1.75 AAU of Saaz hops  
(0.5 oz. of 3.5% alpha acid)  
Yeastlab European Lager yeast  
3/4 cup corn sugar for priming

### Step by Step

Proceed with step mash described above. Add extracts and Hallertauer and boil 60 min. Add Tettnanger to final 15 min. of boil. Turn off heat, add Saaz and steep 5 min. Strain hops, cool to 68° F, pitch yeast. Ferment at 40° F.

## Eye in the Pyramid Wild Rice Helles Bock

(5 gallons, extract with grains)  
OG = 1.066 FG = 1.016 IBU = 45

### Ingredients

1 lb. wild rice  
0.75 lbs. Munich malt  
2/3 lbs. German crystal malt  
(20° Lovibond)  
0.5 lbs. Cara-Pils malt  
4 pounds Laaglander Dutch  
Light Lager kit  
3.3 pounds Northwestern Gold  
malt extract  
12 AAU of Hallertauer  
Hersbrucker hops  
(3 oz. of 4% alpha acid)  
Yeastlab L-32 Bavarian  
lager yeast  
1/2 cup corn sugar for priming

### Step by Step

Boil wild rice in 1 gal. water until gelatinous (45 minutes). Turn off heat, add malt, steep 30 min. Strain out grains and rinse with one half gallon of boiled water. Add malt extracts and Hallertauer Hersbrucker hops and boil for 60 minutes. Strain out hops, top up to 5 gallons with chilled water, pitch yeast when cool. Ferment at regular lager temperatures (40 to 50° F).

and even though it's the least-commercial of his beers, it's one of his all-time favorites. "It sells like nuts for a few weeks and then tapers off," says Kirby. "People have to have it and then they move on to something else."

#### AWARD-WINNING TIPS FROM THE MAN IN MINOCQUA

Rick Meyer is brewmaster at Minocqua Brewing Company in Minocqua, Wisconsin. He's the man behind Island City Wild Rice Lager, which won a gold medal at the 1999 Great American Beer Festival.

Meyer says wild rice is easy for homebrewers to use, but he warns that it easily can take over a beer. "Wild rice must be precooked with a small amount of two- or six-row malt to help get the conversion started," Meyer advises. "I would suggest that the wild rice never exceed 20 percent of the total grain bill, and 10 percent is a good starting point for most."


"The nutty flavor of the rice goes well in amber beers that use some 60° Lovibond crystal malt," says Meyer. "Even with the malt's dark husk, don't expect it to add much color. Wild rice also goes well with roasted malts. One of the best is Briess Malting Company's 'Special Roast.' Most of the good-sized homebrew stores carry it."

#### A WORD FROM OMAHA: A HOMEBREWERS VIEW


Wild rice sugars add lightness, sweetness and boost alcoholic content at the expense of body. Usually, homebrewers counter this tendency toward a thinner brew by adding more malts. The more rice you add, the more malts you will probably need. Chester Waters, a longtime homebrewer from Omaha, says he's in love with the "rich, earthy" character of his award-winning wild rice, rye and caraway beer. He likes wild rice so much that he uses a lot more of it than the Wisconsin

brewmeisters suggest, up to 35 percent of the total grain bill. After finding that wild rice by itself contributed plenty of flavor and full mouthfeel but seemed too soft and flat for his taste, he added malted rye (15 to 25 percent) and three ounces of caraway seed for spice. The resulting orange-brown brew "continues to meld and improve — as well as drop clear — over four to six months," Waters says.

The long period in the carboy also helps with a persistent chill haze that Chester has experienced with wild-rice beer. This may result from the heavy amounts of rice he likes to add to his brews. (Rick Meyer uses about 25 percent wild rice and has never had a problem with chill haze, noting that he doesn't even fine his beers with gelatin, the way some micros do. "I do filter down to 0.5 micron and I use Irish moss. We age our lagers 30 days so they clear on their own," Meyer says.)



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Getting down to particulars, Chester told us, "I'd stick to a neutral yeast (something like Wyeast 1056, American Ale) to let the earthy wild rice, the sharpness of the rye and the caraway shine through. You might consider a Kölsch yeast and lower-temperature fermentation and lagering, with a diacetyl rest, for an even cleaner fermentation. I expect these big flavors to go with a fairly dextrous wort, and low levels of flavor and aroma hops. I use reverse osmosis water and add calcium chloride to adjust, at 50 parts per million."

Chester also suggests using rice hulls to prevent a stuck mash. And since his beer is lively, he uses a few drops of "no-foam" to help control blow-off.

#### A VIEW FROM DOWN EAST

Our friend Brad Hunter, a homebrewer from Appleton, Maine, elaborated on the use of rice hulls in adjunct brewing. "This is a

neutral addition. The hulls will keep the grains from compacting when using a significant amount of 'non-husk' grains like wild rice. I think the prudent use of foundation water under the grain bed when setting up the mash is just as important. It will help keep the whole thing buoyant." Kirby Nelson's advice to homebrewers is to use adequate water in the rice mash, no more than two pounds per gallon.

#### WILD RICE EXTRACT CREAM ALE

Roger Seaver of Mendota, Minnesota discovered that wild rice also can elevate extract brewing. He and some friends were planning an expedition to the Boundary Waters Canoe Area Wilderness and, in the spirit of James Page — whose wild rice beer is called Boundary Waters Golden Lager — he brewed a special wild rice cream ale for the trip. (He bottled it in plastic soda bottles to comply with the BWCAW's "no glass, no cans" rule.)

Roger started with a basic cream ale kit (a box, not a can), added a pound of light dry malt extract and mashed the grain in the kit with one pound of cooked wild rice for 45 minutes. He says the beer "was, in a word, great." It was lighter in body than the kit beer would have been, with a slightly higher original and final gravity.

Most of the wild-rice brewers we spoke with sounded the same note of caution: Wild rice is an ingredient of surpassing potency, not to be added lightly to any beer. At the same time, it's an easy and satisfying ingredient and deserves to be better known. As one homebrewer noted, "after the first taste, it really grows on you." So this fall season, give wild rice a whirl! ■

*Joe and Dennis Fisher are the authors of "The Homebrewer's Garden," "Great Beer From Kits" and "Brewing Made Easy," all published by Storey Books.*

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## WILD RICE: What it is, how to find it

WILD RICE IS THE SEED OF A NATIVE NORTH American aquatic grass, *Zizania aquatica*, which is more closely related to grains such as barley than it is to true rice. It grows throughout the Great Lakes region as well as in Canada. Native Americans traditionally harvested this grass by bending the stalks over the gunwales of their canoes and tapping the heads, causing the grains to fall. This hunter-gatherer approach is still practiced on a small scale.

This "traditional" wild rice can be found in health-food stores, upscale supermarkets and mail-order outlets. It sells for about \$8 per pound. (It's even possible to obtain a "ricing permit" and harvest your own if you live in the Great Lakes region; to secure a permit, start by calling your state Fish and Wildlife department.) "Paddy grown" commercially raised rice is much more common. This sells for roughly \$4 to \$5 per pound.

Jerry Bourbonnais, a Milwaukee homebrewer and co-host of the "Brewpot" radio show, suggests using only naturally grown and harvested lake rice

if you can afford it and find it. "The paddy rice isn't always as mature as the lake rice," he says. "This can cause some flavor problems as well as making it more difficult and time-consuming to gelatinize."

If you can't find wild rice in your local grocery store, here are some additional sources:

### *Barron Specialties*

1020 West Second Street  
Thief River Falls, Minnesota 56701  
Phone: (800) 424-5172; (218) 681-6901

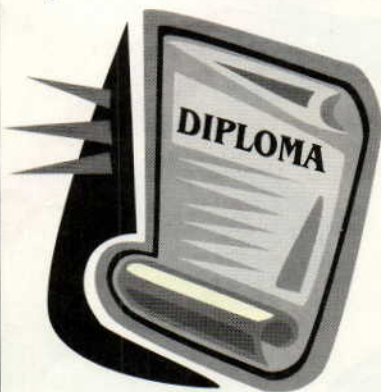
### *C and G Wild Rice*

2803 Harborview Parkway  
Superior, Wisconsin 54880  
Phone: (715) 398-5921

### *Grey Owl Foods*

P.O. Box 88  
Grand Rapids, Minnesota 55744  
Phone: (800) 527-0172

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ILLUSTRATION BY JIM WOODWARD

by  
Mark Henry

**T**HE ST. PATRICK'S DAY CASCADIA CUP HOMEBREW COMPETITION, HELD IN SEATTLE EACH YEAR, IS ONE OF MY FAVORITES. IT IS LARGE ENOUGH, WITH WELL OVER 100 ENTRIES, TO QUALIFY AS A MAJOR COMPETITION AND ATTRACT QUALITY ENTRIES, BUT SMALL ENOUGH THAT THE JUDGES ARE UNLIKELY TO EXPERIENCE "PALATE FATIGUE." THIS YEAR, I ENTERED A CREAM ALE I HAD MADE A FEW WEEKS BEFORE. IT SCORED AN AVERAGE 32 FROM THE THREE JUDGES, WITH COMMENTS LIKE "CLEAR," "BRIGHT" AND "FLAVOR BALANCED." A RESPECTABLE SCORE THAT MEANS THE JUDGES CONSIDERED THIS BEER "VERY GOOD."

What makes scoring a 32 in a regional competition so extraordinary? I used a canned, prehopped "beer kit." And I followed the instructions that came with it. I ignored the sage advice of all the authors, experts and professionals who say that if you deign to use a beer kit you should "throw away the directions and the yeast." I did not boil, I used the yeast that came with the kit, and I added a pound of corn sugar and a pound of rice syrup. Based on the conventional wisdom, this should have been a sure-fire disaster, not a "Very Good" beer. So, what went right?

The first thing to keep in mind is that the "conventional wisdom" is promulgated by a tiny group of homebrewers. While Americans constitute perhaps 5 percent of the world's population of homebrewers, we are nothing if not prolific in producing brewing literature. It would be easy to believe, based on the prevailing literature, that everyone believes this conventional wisdom. Yet the vast majority of homebrewers in the world use prehopped beer kits, follow the instructions and make good beer.

The best beer kits are essentially concentrated wort. The producer of the kit mashed various grains, sparged, added hops, boiled and then reduced the liquid down to a syrup. The types and amounts of grains



don't  
boil it!

Here in the United States, conventional homebrewing wisdom holds that you should always boil prehopped extract beer kits. But does this help or hurt your beer? One expert offers some revolutionary advice: Follow the instructions on the kit!

## The sugar file

All beer kits need additional fermentables. Why? There simply are not enough fermentables in the can to make five gallons of beer. Don't use table sugar; it's not intended for brewing. Here's a quick rundown of better options.

**CORN SUGAR:** The most common fermentable; also referred to as "brewer's sugar." Advantages: widely available, easy to use, inexpensive. Allows brewer to produce light-bodied, light-colored beers. Disadvantages: use too much and your beer will take on a "cidery" flavor. Usage: 1 to 2 lbs.

**UNHOPPED MALT EXTRACT:** Dry malt extract (DME) is the most common fermentable used by U.S. kit brewers. Advantages: will give beer more body and mouthfeel. Disadvantages: more likely to increase body and color beyond what is desired. Usage: 1 to 3 lbs. of DME or 3.3 lbs. liquid unhopped malt extract.

**RICE:** Available in dry and syrup form. Advantages: Will give beer body without significantly increasing color. Disadvantages: relatively expensive, not as widely available, contributes little to the flavor. Usage: 1 to 2 lbs.

**INVERT SUGAR:** A derivative of cane sugar. Highly fermentable. Advantages: similar contributions as corn sugar with less "cidery" effect. Disadvantages: not widely available. Usage: 1 to 2 lbs.

**OTHER SUGARS:** Belgian candi sugar, demerara sugar, brown sugar. All similar to corn sugar in usage and advantages. The disadvantage of candi sugar is cost. Each contributes its own unique flavor profiles.

When working with sugars, best results are achieved by not exceeding recommended usage, and by mixing-and-matching. Experiment! Have fun! You will be surprised with what you can achieve with a pound of rice and a pound of brown sugar.

and hops are dictated by the type of beer the producer intends will be made. All that's left to do is add water and fermentables, pitch the yeast and ferment. No mashing, no sparging. No "pre-hopping," "dry-hopping" or "bunny-hopping." And no boiling. Quick, easy, foolproof.

Why the prejudice by experts against beer kits and their instructions? As the former owner of a homebrew shop, I have heard all of the arguments: "You have to boil to get protein coagulation." "You have to boil to sterilize." "The yeast is old or inappropriate." These are among the common charges leveled against kits. When these myths are examined, none stand up to scrutiny.

### Myth: You have to boil to get protein coagulation.

Virtually all of the higher-quality beer kits have already been boiled before being concentrated. The best ones, including Coopers and Muntons, have also undergone filtration to remove coagulates. And contrary to conventional wisdom, it is not even necessary to boil your wort if you're adding unhopped malt extract. "I'll be the first to admit it: After all I've read, I'm surprised my test beers came out great," said Beer Essentials owner Robert Christian after making a series of beers using kits and malt extract without conducting a boil.

### Myth: You have to boil to sterilize the wort.

Few of us brew in a laboratory environment. So sterilization is a hopeless quest. Instead, sanitation is the key to ensuring high-quality beer. Most kit instructions emphasize the use of boiling water both in sanitizing equipment and mixing ingredients, despite the fact that boiling is not necessary to achieve sanitation. Adequate sanitation can be achieved by holding the temperature of your re-constituted wort at 160 to 180° F for 15 minutes.

### Myth: Shouldn't I boil anyway? What's the harm?

Not only is it not necessary to boil, it can have a significant nega-

tive impact. Any time you boil anything malt-related, you will get caramelization-induced darkening. The more you boil, the darker the finished beer. That's OK if you are making a stout, but not so good if you want a nice cream ale. Another side effect of caramelization is excessive sweetness in the finished beer.

Boiling can also change the hop character the producer was seeking to achieve. Boiling a beer kit will drive off any hop aromatics the beer was supposed to have. Of course, you can just add more hops, but if you don't boil, you don't have to.

### Myth: You can't make good beer unless it's all-malt.

The instructions on most beer kits call for adding 1 kg of fermentables, typically in the form of "brewing sugar," although more manufacturers are adding lines such as "for a fuller-bodied beer, add malt." Adding fermentables is necessary to get your wort up to an alcohol and body level that is appropriate for beer. The key is not that the beer is "all-malt," but that any non-malt fermentables do not exceed the level that renders the beer undesirable to your own tastes.

Based on information published by CAMRA (the British Campaign for Real Ale) many of England's best-loved "real" ales, including Boddington's Bitter, Courage Best Bitter and Beamish Irish Stout, are made using such fermentables as corn sugar, "maltose syrup" and caramel. Generally I recommend that fermentables like corn sugar, rice and molasses not exceed 25 percent of total gravity contribution; however, in instances where a really light colored and bodied beer is desired, this can be exceeded. The most important consideration is what you want.

### Myth: The yeast is old or inappropriate.

Not only do many manufacturers date-stamp their cans, they also date-stamp their yeast packages. Look for them. If the use-by date is past, then toss the yeast and buy a fresher packet.



Only on the “appropriateness” issue do I find common ground with conventional wisdom. In some cases, it is necessary to sacrifice stylistic integrity for ease of use. Most, but not all, “lager” kits actually contain ale yeast. This is done to allow brewers to make a beer as close to a lager as possible without taking over the kitchen refrigerator. If you want your lager beer kit to make a “real” lager, either buy a kit that contains a lager yeast or purchase a pure liquid lager yeast.

### **Myth: Someone else has decided the hop schedule.**

Well, yes. By the very nature of a beer kit, some of the recipe formulation has been pre-determined. What you get for giving up determining the hop schedule is quick, easy and foolproof brewing.

### **What about the water...**

If you feel comfortable drinking your tap water, there is no reason why you can't brew with it. If the chlorine being added by your municipal water system is gassable (some systems are now using chlorine that won't gas out), then most of the chlorine is expelled when you bring your brewing water up to 160° F. What chlorine is left is largely undetectable. If you won't drink your tap water, then you probably don't want to brew with it anyway, boiled or not.

### **...and the fermentation times?**

The instructions on beer kits for fermentation times are sometimes conflicting and are often vague. This is in response to the different conditions that exist for brewers in different geographical areas. When fermented out at 68° to 72° F, most beer kits will complete their fermentation in 2 to 4 days, with the beer cleared in another 4 or 5 days. But some parts of North America don't see temperatures that high for months. Some parts don't see temperatures that low for months. With that in mind, most kit instructions simply try to do a good job of alerting brewers to the signs that their fermentation is finished.

Confusion often arises when the brewer tries to incorporate practices described in other literature. Kit instructions do not detail the intricacies of two-stage fermentation. If you're going to try this, consulting your local expert is key. Of course, when making a good beer from a kit, two-stage fermentation is not necessary. The key to fermentation times is to give it enough time to ferment and clear without going more than 10 days before bottling. Leaving your beer in primary longer than this increases the risk of getting yeasty off-flavors. If your fermentation is taking this long to complete then the fermentation temperature needs to be raised.

Most beer-kit producers are international concerns. Their products are intended for brewers all over the world. Out of necessity, the instructions are designed to be understandable to the broadest array of brewers and brewing cultures. And although I think the instructions are just fine as written, let's expand upon them a bit. Here are the guidelines I provide new brewers looking to make good beer. Quick, easy, foolproof.

### **Instructions for making great beer from a prehopped kit**

1. Bring 2 quarts of water to 160° to 180° F, steaming but not boiling. Then remove from heat.
2. Add your beer kit and fermentables according to the directions. Suggested fermentables include brewer's sugar, dry malt extract, liquid malt extract, rice syrup, demerara sugar, Belgian candi sugar or any combination.
3. Stir aggressively so everything gets dissolved. Put a lid on the pot and let it sit for 10 to 15 minutes on the lowest heat setting. This should keep your temperature in the 160 to 180° F range to ensure sanitation.
4. Add the contents of your pot to 4 gallons of water already in your fermenter. Mix well, at least a minute or two. This helps aerate your wort prior to your yeast addition. If you take hydrometer readings, you will need to mix aggressively for a good

4 to 5 minutes to get even consistency throughout the wort.

5. When the side of your fermenter feels cool to the touch, it is safe to add your yeast. Some authors recommend re-hydrating your yeast in water first. I have never been able to discern a difference when doing side-by-side comparisons with good quality yeasts, and I don't care for the additional contamination risk.
6. Ferment as close to recommended temperature range as possible.
7. When activity in the airlock drops to a bubble every 1.5 to 2 minutes, fermentation is pretty much done. If this has been completed within 2 to 4 days, leave in fermenter for an additional 2 to 4 days for clearing.
8. When you are ready to bottle, put your clean bottles upside down in the bottom rack of your dishwasher and run it through the rinse and dry cycle. Be sure the “heat dry” option is on; steam sanitizes your bottles. Boil 1 cup of water with 3/4 cup of corn sugar for a few minutes. Allow to cool, then add to your sanitized bottling container. Transfer your beer to your bottling container, stir gently and bottle.

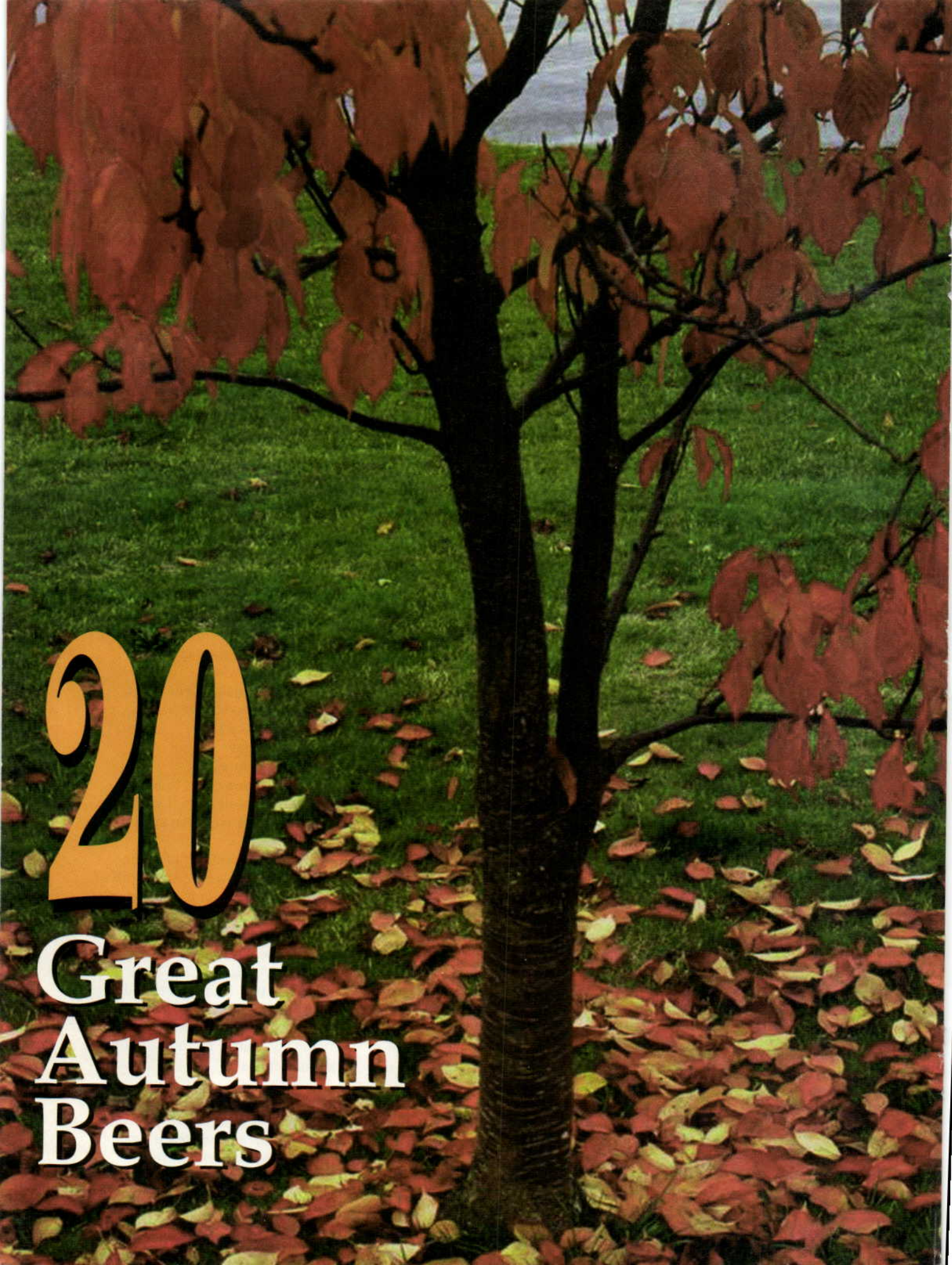
### **My “Very Good” Cream Ale**

1 Coopers BrewMaster Series  
Pilsner Beer Kit  
1 lb. corn sugar  
1 lb. rice syrup solids

Prepare according to instructions. Ferment at 62° F for 7 days. Bottle with 3/4 cup corn sugar.

There are millions of homebrewers in the world. Almost all of them are interested in making good beer. But plenty of them are not interested in spending six hours in the kitchen with three pots, a flame-thrower of a burner and \$600 of stainless steel. Beer kits are all about making good beer as simply and easily as possible. Revel in its simplicity and by all means: Follow the directions! ■

*Mark Henry is an award-winning homebrewer and former homebrew supply-shop owner. He's a partner in Cascadia Importers, North American importer for Coopers.*



20

Great  
Autumn  
Beers

*Homebrew shop owners from across the country serve up their favorite fall recipes for easy and excellent extract-based beers.*

by Dawnell Smith

Say goodbye to summer's thirst-quenching pale beer and hello to the deep hues of autumn in a glass. For homebrewers, the fall season means creating and savoring darker, richer flavors and colors. It also means rediscovering the power of a potent pint. Summer brew may slake a parched throat, but winter beer soothes the soul.

"Seasonal traditions still influence the styles of beer available," writes Michael Jackson in *Michael Jackson's Beer Companion*. "So does the weather: Lighter-bodied, more quenching beers best suit the summer; heavier, sustaining ones warm the winter."

Given this seasonal cycle of suds, it makes sense that the owners of homebrew supply stores would offer Oktoberfest beer recipes to people looking for the consummate fall creation. But other appealing choices range from old ales, biters and dark lagers to winter warmers, spiced beers, smoked porters and stouts.

In a quest to capture the season's possibilities, we asked people in the homebrew business to recommend their favorite extract-based recipes for fall. Each recipe is for a five-gallon batch. The following guidelines come straight from the experts and include their own beer descriptions and step-by-step advice. Before we turn to the recipe file, here are some tips for making excellent beer from malt extract.

## TOP TIPS TO PERSONALIZE EXTRACT BREW

Throwing a can of extract into a pot of water can seem a bit humdrum, so many homebrewers personalize their beer by adding their own dash of pizzazz. Our panel of shop owners offer these suggestions for making your homebrew bubble with personality.

**USE SPECIALTY GRAINS.** Use a base of mostly pale extract, regardless of style, then augment with grains to achieve your flavor and color goals. When selecting these grains, choose something intriguing, new or distinct. Mark and Cathy Scheitlin of Oahu Homebrew Supply in Honolulu suggest De Wolf-Cosyns or Gambrinus honey malt, which gives beer a distinct sweet and nutty flavor. Or just walk the aisles of the supply shop to find your own secret ingredients.

**EXPERIMENT WITH HOPS.** Buy extract, but do your own hop work. Using unhopped extract "allows the brewer to control all ingredients added and allows them to see what is used in making a particular beer style," explains Phil Mathis of Homebrew Adventures in Charlotte, North Carolina.

**USE RECIPES AS A GUIDE.** "The biggest disappointment for some people is finding an extract recipe they would like to try, but when they get to their local homebrew shop they can't find the specified ingredients," say the Scheitlins. "In most cases a perfectly acceptable substitute is available." In other words, improvise! As Mathis explains, "you can change hop types, hop amounts, change malt types, change malt amounts, change yeast type, change specialty grain types and amounts, add fruit or fruit flavoring, add herbs or spices,

and  
it can  
go on and on.

Have fun!"

But don't forsake the tried and true. Not all malt extracts are created equal. Often, finding and using the right extract makes all the difference. For instance, Michael Dawson and Chris Schiffer of Northern Brewer Ltd. insist on certain brands when making their Oktoberfest beer. "Malt aroma and flavor are the centerpiece of any good Oktoberfest," they note. "That comes not from crystal malt, but from good two-row base malt along with a high proportion of high-kilned malt like Munich or Vienna." To get the desired effect, they use Alexander's Munich malt syrup (a fifty-fifty blend of Munich and Klages two-row malts). "This is the only syrup to use for authentic character in any style of malty lager," they add.

**USE "SWEEP THE FLOOR" BREWING TACTICS.** The Scheitlins' favorite way to personalize a homebrew is simple: They toss unused hops, grains and extracts into the pot. "But be careful here," they warn. "Don't just throw it all in and hope for the best. Use the knowledge you've gained from homebrewing to formulate your own special recipe with the leftovers you need to use up anyway." In other words, ignore style

**FOR HOMEBREWERS,  
AUTUMN MEANS  
CREATING DARKER,  
RICHER FLAVORS  
AND  
COLORS.**



guidelines, trust your instincts and test your knowledge. Then step back and watch the sparks fly.

**ENLIVEN YOUR BEER WITH MOTHER EARTH.** Brewers around the world have used fruits, herbs, spices and other organic materials in beer since the advent of our favorite beverage. If it's organic and it won't kill you, try it when brewing. Grab stuff out of the backyard, the woods or the local health-food store. Choices range from spruce tips, dandelions and chamomile to blueberries, licorice and ginger. Go easy at first, especially with spices — once you add too much, you can't go back! — but keep an open mind.

**GIVE UP ROUTINE AND DISCOVER THE UNKNOWN.** Instead of using the same brands and ingredients, choose other products for the same recipes. This is a great way to learn how different ingredients affect the flavor of a finished beer. For example, try dry malt extract instead of liquid.

Mathis actually prefers dried malt "because of economics, color control and the fact that dried malt will not oxidize like liquid malt can. Dried malt also does not have the water content that liquid malt has, so when someone buys 5 pounds of dried malt, they are actually getting 5 pounds of malt. Liquid malt has an average of 20 to 25 percent water content."

## TOP TECHNIQUES TO MAKE YOUR EXTRACT BREWING A BREEZE

Nothing makes a brew day more frustrating than little mistakes that lead to headaches and flawed beer. The famous slogan, "Relax, don't worry, have a homebrew" doesn't always cut it when the going gets tough, so why not make things easy from the get-go?

With that notion in mind, the people who shared the accompanying recipes offer these valuable techniques for making malt-extract homebrewing more enjoyable, fruitful and satisfying.

1. Remove the pot of hot water from the heat source before adding extract in order to prevent scorched goo (caramelized or burned sugars).
2. If the extract comes in a can or other heat-friendly package, heat the container before pouring to get all the good stuff in the brew pot.
3. Make sure all of the extract dissolves. Fill your brew kettle with two gallons of warm water, add the extract and stir thoroughly. You can start the dissolving process 15 minutes — or even a few hours — before turning up the heat. To be sure it's dissolved, dive in with clean hands to feel for any syrupy malt on the bottom of the pot.
4. If possible, start with a lot of water in the pot. Scott Newcomb of The Brew Hut in Aurora, Colorado, suggests that you use a 7.5- to 8-gallon brew pot with 6 gallons of water, which will allow greater saturation from the grain and hops to make it a fuller-bodied beer with more hop character and aroma. You will lose about a gallon during the boil to yield about 5 gallons in the primary fermenter.
5. Use specialty malts like dextrin (carapils) and wheat malt to improve head retention and foam, even if you don't care about flavor and color issues. Up to a half pound of either malt does the trick.
6. Think about clarity ahead of time by adding one teaspoon of Irish moss to the kettle about 15 minutes before the end of the boil. For best results, rehydrate it in a pint of water before using.
7. Though extract leaves less residue in the wort, think about using a secondary fermentation vessel for a week or two to clarify and refine the beer.
8. After putting your grains in a steeping bag, shake the bag briefly over a trash can to knock any excess flour out of the grain. This may improve the overall clarity of your finished beer, especially when using malts that contain a bit of unconverted starch, such as biscuit or aromatic.
9. Add a few hops to your kettle before it boils to break the surface tension of the wort and lower the risk of a messy boilover.
10. Pay attention to issues resulting from partial-wort boiling — the process of using 2 or 3 gallons of water in the boil and then topping it to full volume after the boil. Dawson and Schiffer of Northern Brewer make a point of specifying different hop rates for different volumes since "during the boil, the density (specific gravity) of the wort is very high, which makes hop utilization low." Many recipes assume a low boil volume, so you may need to adjust hop rates accordingly.
11. This tip comes from Forrest Rogness of Austin Homebrew Supply in Austin, Texas: "When you're emptying a carboy full of water, insert your racking tube. The water will drain four times as fast."

*If you can't find a suggested extract at your favorite retail outlet, ask an employee. In most cases, a good substitution will be available.*

## BADER'S OKTOBERFEST

OG = 1.048 FG = 1.016 IBUs = 35

This popular Oktoberfest recipe creates a medium-amber beer with a malty aroma and flavor. This version has extra hop bitterness, which reflects a regional trend: Many microbrews in the Portland area rate at the high end — or often above — the normal IBU range for that particular style.

*Steve Bader*

*Bader Beer and Wine Supply  
Vancouver, Washington*

### Ingredients

6.6 lbs. Coopers light malt syrup  
1/2 lb. crystal malt (40° Lovibond)  
1/2 lb. Briess Victory malt  
1/8 lb. chocolate malt  
9 AAU Hallertauer hops  
(1.5 oz. of 6% alpha acid)  
6 AAU Hallertauer hops  
(1 oz. of 6% alpha acid)  
1 tsp. Irish moss  
Oktoberfest Lager yeast  
(White Labs WLP-820)  
3/4 cup corn sugar for priming

### Step by Step

Steep crushed grains in 2 gallons of 150° F water for 30 minutes. Remove grain from hot water with a strainer, then bring water to a boil. When boil starts, remove pot from burner and stir in malt syrup. Return to a boil, then add 3 ounces of Hallertauer hops.

Total boil is 60 minutes. Boil 15 minutes and add Irish moss. Boil 42 more minutes and add one ounce Hallertauer. Boil three minutes and turn off heat. Strain the hot wort into a sanitized carboy filled with 2 gallons of cold water, then top off to the 5.5-gallon mark. Add yeast when beer is less than 75° F, and ferment at 50° to 55° F until fermentation is complete. If not bottled within three weeks, rack into a keg or secondary until bottling.

## OAHU OKTOBERFEST

OG = 1.052 FG = 1.015 IBUs = 38

This amber-colored, hoppy ale is an Oktoberfest-style beer for the brewer who neglected to get that

Märzen into the lagering freezer back in March. The addition of a little amber syrup malt extract gives this ale a festive fall color.

*Mark and Cathy Scheitlin  
Oahu Homebrew Supply  
Honolulu, Hawaii*

### Ingredients

5 lbs. Alexander's pale  
syrup malt extract  
2 lbs. Alexander's amber  
syrup malt extract  
1/2 lb. Briess crystal malt  
(10° Lovibond)  
1/2 lb. De Wolf-Cosyns CaraVienne  
malt (24° Lovibond)  
1/2 lb. De Wolf-Cosyns CaraMunich  
malt (62° Lovibond)  
7 AAU Hallertauer hops  
(2 oz. of 3.5% alpha acid)  
1.9 AAU Liberty hops  
(1/2 oz. of 3.7% alpha acid)  
1.9 AAU Liberty hops  
(1/2 oz. of 3.7% alpha acid)  
2 pkgs. Muntons Yeast or one bag  
Wyeast 1007 (German Ale Yeast)  
3/4 cup corn sugar for priming

### Step by Step

Put grains in mesh bag, put into a pot with 2 gallons of cool water and turn on heat. When water approaches a boil, remove the grain bag. Do not boil the grains! Let liquid drip into the pot, but don't squeeze it. Return liquid to boil, then remove from heat and add extract. Boil for 60 minutes, adding 2 oz. of Hallertauer at the start.

After 30 minutes, add 1/2 oz. of Liberty hops. Boil another 28 minutes and add 1/2 oz. of Liberty hops. Boil two more minutes, turn off heat and cool wort. Pour wort into the fermenter, top off with cool water to 5.5 gallons and pitch yeast when wort is at or below 80° F.

If using Muntons, rehydrate it first in a pint of pre-boiled, luke-warm water, allow to sit for 10 minutes, then stir with a sanitized spoon. Add this to wort and ferment between 65 to 75° F. If using Wyeast 1007, follow the directions on the package and aerate the wort well before and after pitching.

Ferment between 55 to 68° F in a dark place. Leave in primary for one week and transfer to secondary for at least one week (add an extra week if dry-hopping). When fermentation is complete, transfer to a bottling bucket, prime with 3/4 cups corn sugar and bottle. Condition the beer in bottles for two to three additional weeks at normal fermentation temperatures.

## GERMAN FESTBIER

OG = 1.067 FG = 1.020 IBUs = 30

This German festbier has a deep amber color and just enough hops to balance out the clean malty flavor. The secret weapon is Alexander's Munich malt — this is the best extract to use to get the authentic malt character that's key for this style. The final gravity is at the upper limits of the style guidelines for Oktoberfest, but hey — it's a party!

*Chris Schiffer and Michael Dawson  
Northern Brewer, Ltd.  
St. Paul, Minnesota*

### Ingredients

6 lbs. Alexander's Munich  
malt syrup  
3.3 lbs. Northern Brewer Gold  
malt syrup  
1 lb. Durst medium crystal  
malt (45° Lovibond)  
5.25 AAU of Hallertau Hersbrucker  
hops at 60 minutes if boiling  
5.5 to 6 gallons (1.5 oz of 3.5 %  
alpha acid)  
8.75 AAU of Hallertau Hersbrucker  
hops at 60 minutes if using a  
partial boil with 2 to 3 gallons  
(2.5 oz. at 3.5% alpha acid)  
1.75 AAU of Hallertau Hersbrucker  
hops at 20 minutes  
(0.5 oz of 3.5% alpha-acid)



White Labs Oktoberfest Lager  
yeast (WLP-820)

### Step by Step

Steep crushed grain in 6 gallons of water and turn on heat. Remove grain when water reaches 170° F and continue heating. When liquid boils, remove kettle from stove and add malt syrup. Stir to dissolve, then bring back to boil for 60 minutes and hop at the specified times.

After boil is finished, chill wort quickly and pour or rack it into the primary fermenter. Top up with cooled, boiled water if necessary. Pitch yeast and aerate well. Primary fermentation: ten to fourteen days at 52° to 58° F. Secondary fermentation and lagering: six weeks, gradually lowering temperature by 2° F per day down to 32° to 36° F. Bottle with 3/4 cup dextrose, or keg and force carbonate.

### CZECH DARK SLADEK

OG = 1.053 FG = 1.012 IBUs = 40

The Czechs, who gave the world pilsner, also brew full-bodied dark lagers. In Czech, the word for brewer and maltster is the same — “sladek.” So this recipe is named “Czech Dark Sladek” in honor of the brewer and maltster with whom I spent 14 hours making a lager at his small brewery in the foothills of the Jeseniky mountains. This is in northern Moravia, where beer was first brewed 500 years ago.

This recipe is an extract-based adaptation of that dark lager. The recipe uses mostly Czech ingredients to yield a rich, malty dark beer that all sladeks would enjoy.

*Lynne O'Connor  
St. Patrick's of Texas  
Austin, Texas*

### Ingredients

6 lbs. Czech pale malt extract syrup  
2 lbs. Marie's Munich malt  
extract syrup  
1/2 lb. Czech crystal malt  
(55° Lovibond)  
1/8 lb. Czech black patent malt  
5 AAU Czech Bor hops  
(1 oz. of 5% alpha acid)

6.8 AAU Czech Sladek hops  
(1 oz. of 6.8% alpha-acid)  
3.5 AAU Czech Saaz hops  
(1 oz. of 3.5% alpha-acid )  
Budvar 2000 WyeastXL  
1 cup corn sugar for priming  
(or 1.5 cups Czech dried  
malt extract)

### Step by Step

Steep grains in 160° F water for 15 minutes, then discard. Add malt extracts and Bor hops, then bring to a boil for a total of 60 minutes.

After 15 minutes, add Sladek hops, then add Saaz hops for the last 20 minutes of the boil. After boil, cool to 65° to 70° F, pitch yeast and ferment 12 days at 47° to 51° F. Transfer to secondary and lager for 3 weeks to 3 months at 36° F. Prime with corn sugar and bottle.

### AUTHENTIC OLD ALE

OG = 1.085 to 1.086 FG = 1.019 to 1.021 IBUs = 35

This is probably the best old ale we've tasted. It was brought back from England by a customer; it's from a commercial recipe brewed by Frederic Robinson Ltd., the Unicorn Brewery, in Lower Hillgate, Stockport, Cheshire, England.

Old Tom is a wonderful beer for autumn — it's malty, fully bodied and complex. It's just the beer to serve after raking leaves or picking pumpkins. The commercial version of Old Tom comes with a tomcat on the label. The written recipe states that “Old Tom ale stalks in with a light, tabby tan head and lays down on a deep brown beer.” It describes the beer as having a malty aroma and a palate full of dried berry fruits that slink off with a surprising dryness and an alcoholic meow.

*Tess and Mark Szamatulski  
Maltose Express  
Monroe, Connecticut  
Authors of “Clonebrews”  
(Storey Books) and “Beer Captured”  
(Maltose Press)*

### Ingredients

9.5 lbs. Muntons extra light  
dry malt extract (DME)

1 lb. British crystal malt  
(55° Lovibond)  
6 oz. torrified wheat  
2.5 oz. British chocolate malt  
8 AAUs of Kent Goldings hops  
(2 oz. of 4% alpha acid )  
5 AAU of East Kent Goldings hops  
(1.25 oz. of 4% alpha acid)  
4 AAU of East Kent Goldings hops  
(1 oz. of 4% alpha acid)  
1 tsp. Irish moss  
Wyeast 1028 (London Ale) or  
Wyeast 1318 (London Ale III)

### Step by Step

Heat 1 gallon of water to 160° F and add the grains. Remove the pot from the heat and steep at 150° F for 30 minutes. Strain the grain water into the brew pot and sparge the grains with 1/2 gallon of 150° F water. Now bring the liquid to a boil, remove from the heat and add the extract and 2 oz. of Kent Goldings. Add water until the total volume is 3.5 gallons, boil for 45 minutes, then add 1.25 oz. East Kent Goldings and 1 tsp. Irish Moss.

After another 14 minutes, add 1 oz. East Kent Goldings and boil one more minute before removing pot from the stove and chilling the wort. Strain the cooled wort into the primary fermenter and add cold water to obtain 5 gallons. When the temperature is below 80° F, pitch yeast.

Ferment at 68° to 72° F for 7 days or until fermentation slows, then siphon the wort into a secondary fermenter. Keep it in the secondary until fermentation is complete, target gravity is reached and the beer has cleared (approximately 3 weeks).

Prime with 1.25 cups of Muntons Extra Light malt extract. Boil it in 2 cups of water for 10 minutes before bottling. Bottle condition at 70° F for approximately 5 weeks until carbonated, then store at cellar temperature.

### SIX-GRAIN ENGLISH ALE

OG = 1.060 FG = 1.012 IBUs = 30

This soft and mildly hopped six-grain English ale has terrific head retention and a foaming action

that brings to mind a pint of Guinness. It's a very drinkable ale with "bread" tones.

*Tom Lonsway  
Homebrew Market  
Appleton, Wisconsin*

### Ingredients

6 lbs. Northwestern Extract (Gold)  
1/2 lb. white wheat malt  
1/2 lb. rye malt  
1/2 lb. biscuit malt  
1 oz. flaked oats  
1 oz. flaked rice  
1 oz. flaked corn  
6.8 AAU of Fuggles pellets  
(2 oz. of 3.4% alpha acid)  
5.1 AAU of East Kent Goldings  
pellets (1 oz. of 5.1% alpha acid)  
1 pkg. Wyeast 1275  
(Thames Valley Ale Yeast)

### Step by Step

Heat water to 170° F, add wheat and rye grains along with the flaked oats, rice and corn. Steep for 45 minutes. Remove spent grains and flakes and add the extract, then bring to a boil. After 15 minutes, add the Fuggles hops.

Boil another 30 minutes and add the East Kent Goldings hop pellets. Boil another 10 minutes, turn off the heat. Cool wort and transfer to primary. Ferment at 70° F for a week, transfer to secondary for a week or more and prime with 3/4 cups corn sugar before bottling.

### HOME BREW SHOP SCOTTISH ALE

OG = 1.052 to 1.055 FG = 1.013 to 1.015 IBUs = 40

This Scottish ale is known as the "Homebrew Shop Special" and has lots of fans in Chico. The beer has a rich body and lots of malt flavor and aroma, but can get fruity if fermented at a high temperature.

*Dawn Letner  
The Homebrew Shop  
Chico, California*

### Ingredients

7 lbs. Scottish Tartan Red  
malt extract  
1 lb. Special B malt

1/2 lb. caramel malt  
(60° Lovibond)  
5.2 AAU of Willamette hops  
(1 oz. of 5.2% alpha acid)  
5.2 AAU of Willamette hops  
(1 oz. of 5.2% alpha acid)  
6 AAU of Mt. Hood hops  
(1 oz. of 6% alpha acid)  
1 tsp. sea salt  
1 tsp. Irish moss  
Wyeast 1056 (American Ale yeast)  
3/4 cup corn sugar for priming

### Step by Step

Steep grains in 2 gallons of water at 150° to 170° F for 20 minutes. Remove, sparge, add extract, top kettle to 5.5 gallons and bring to boil. Total boil is 60 minutes. At start of boil, add one ounce of Willamette hops and 1 teaspoon sea salt. Boil 30 minutes. Add one ounce of Willamette hops and one teaspoon Irish moss, boil 20 minutes. Add one ounce of Mt. Hood and boil 10 minutes. Turn off heat, cool wort and add yeast. Ferment at 68 to 70° F for 10 days, move to primary for a couple of weeks and bottle. Condition at fermentation temperature for a few more weeks.

### SMOKED PORTER

OG = 1.048 FG = 1.010 IBUs = 40

This robust porter has an undertone of peat-smoked malt. The subtle smoke and big flavor pairs well with a cigar or smoked game.

*Matt Causey  
Beer at Home  
Englewood, Colorado*

### Ingredients

7 lb. amber liquid malt extract  
3/4 lb. crystal malt (70° Lovibond)  
3 oz. peat-smoked malt  
1/4 lb. Karaffe malt  
3 oz. chocolate malt  
1/4 lb. roasted barley  
6.8 AAU of Cluster hops  
(1 oz. of 6.8% alpha acid)  
3.1 AAU of Liberty hops  
(1 oz. of 3.1% alpha acid)  
2 AAU of Fuggles hops  
(1/2 oz. of 4.1% alpha acid)  
White Labs English Ale Yeast  
(WLP-002)

### Step by Step

Put grains in bag and heat with brew water. Bring to boil in 30 to 60 minutes, remove grains, add extract and bring back to boil. Total boil is 60 minutes. Add Cluster hops at start of boil, Liberty halfway through and Fuggles with 5 minutes to go. Cool, add yeast and ferment at ale temperature (around 70° F). When fermentation slows, move to secondary. Let ferment, allow beer to clear and bottle with 3/4 cups of corn sugar. Age at fermentation temperatures for a few weeks.

### THE GRAPE AND GRANARY STOUT

OG = 1.063 FG = 1.015 IBUs = 49

This oatmeal stout has lots of body, roasted flavor and a long, silky finish from oats. It placed first at the Ohio State Fair homebrew competition in 1997 and is a perennial favorite with customers.

*John M. Pastor  
The Grape and  
Granary, Inc.  
Akron, Ohio*

### Ingredients

3 lbs. Briess Gold  
dried malt  
extract  
3 lbs. Muntons  
light dried malt  
extract  
1 lb. Briess lager  
malt (two-row)  
0.75 lbs. Briess black  
barley malt  
0.25 lbs. Briess roasted barley  
0.25 lbs. DeWolf-Cosyns  
chocolate malt  
0.5 lbs. Briess crystal  
malt (120° Lovibond)  
1 lb. Briess  
flaked oats  
12 AAU of Northern Brewer pellet  
hops (1.5 oz. at 8% alpha acid)  
Wyeast 1028 (London Ale)

### Step by Step

Steep the grains in a straining bag in water between 150° to 160°

F for 30 minutes. Remove all grains and discard. Then bring liquid to a boil, add the extract and boil for 45 to 60 minutes. Add the bittering hops at start of boil. After the boil, cool and pitch with Wyeast 1028 yeast. Ferment at 65-70° F for 3-5 days. Rack to secondary and allow to clear for 5 to 7 days. Bottle with 3/4 cups corn sugar or 1-1/4 cup dried malt.

## THE BREW HUT OATMEAL STOUT

OG = 1.065 FG = 1.015 IBUs = 56

This beer is not too dry and not too sweet. It has a thick, creamy head from the flaked oats and carbonating with dry malt extract.

*Scott Newcomb  
The Brew Hut  
Aurora, Colorado*

### Ingredients

8 lbs. dark malt extract  
1 lb. stout roasted barley  
1/2 lb. chocolate malt  
1/4 lb. black patent malt  
3/4 lb. crystal malt  
(120° Lovibond)  
1 lb. flaked oats  
15.5 AAU of Bullion hops  
(1.5 oz. of 10.3% alpha acid)  
5.2 AAU of Fuggles hops  
(1 oz. of 5.2% alpha acid)  
5.2 AAU of Bullion hops  
(0.5 oz. of 10.3% alpha acid)  
Wyeast 1084 (Irish Ale yeast)

### Step by Step

Steep grains in 4 gallons of water at 150° F for 30 minutes. Remove grain, stir in extract and bring to a low, rolling boil. Add 1.5 ounces of Bullion hops as soon as the liquid boils.

After 45 minutes, add Fuggles hops, then let boil another 10 minutes and add 0.5 ounces of Bullion hops. Let boil 5 more minutes, then remove hops from the pot (use bags or strain them out) and cool the wort to 72° F. Transfer to primary fermenter and top off to 5 gallons with cool water. Pitch yeast and ferment in primary for 7 days at 72° F, then rack to secondary for another

7 days in a cool location. Prime with 1.25 cups of dry malt extract for bottling. Condition in bottles for four weeks at room temperature.

## YULE GLOW SPICED STOUT

OG = 1.073 FG = 1.018 IBUs = 50

This mildly spiced stout is a favorite at our shop. As the name says, "Yule Glow" when you try this rich, spiced, high-alcohol stout.

*Koelle Paris  
St. Louis Wine & Beermaking  
St. Louis, Missouri*

### Ingredients

5-1/2 gallons of bottled spring water or pre-boiled tap water  
2 cans dark malt extract syrup (3.3 lbs. each)  
2 lbs. dark dry malt extract (5.5 cups)  
1.5 lbs. Vermont maple syrup  
1 cup malto-dextrin  
1 lb. crushed crystal malt (80° Lovibond)  
1/2 lb. crushed English roasted barley  
1/2 lb. crushed English black patent malt  
19 AAU of Centennial hops (1.8 oz. of 10.5% alpha acid)  
1 tbs coarse freshly ground nutmeg  
2 cinnamon sticks  
2 tsp. gypsum  
White Labs WLP-005 (British Ale yeast)  
3/4 cup of corn sugar for priming

### Step by Step

Place 3-1/2 gallons preboiled water in freezer prior to beginning batch for cooling wort later.

Crack grains and place in 2 gallons of cold water. Slowly raise temperature to 170° F, then turn off the heat and strain out the grains. Add gypsum, malt extracts, maple syrup, malto-dextrin and Centennial hops, stirring constantly. (This is a high-gravity batch and must be stirred thoroughly to avoid scorching.)

Bring to a boil. After 50 minutes, add the nutmeg and the cinnamon and boil for 10 minutes more.

Total boil time is 60 minutes. When complete, remove from heat

and strain the wort into sanitized primary fermenter containing 3-1/2 gallons of chilled water. Sparge the hops with an additional 1/2 gallon of cold water. Once the wort has cooled, stir vigorously to aerate and add yeast. Do not aerate wort until it has cooled! Ferment at 60 to 70° F in a dark place. After active fermentation (approximately 3 days), siphon beer off the sediment into a sanitized secondary fermenter and attach airlock. Place in a cool dark place until fermentation has ceased and your beer is clear (approximately 10 days). Prime and bottle using 3/4 cups corn sugar in 1/2 cups water. Let bottles age at 60 to 70° F for about 2 weeks.

## ENGLISH PALE ALE

OG = 1.058 FG = 1.015 IBU = 25

This is one of my favorite beers, period. And this recipe is definitely one of our top sellers. I usually make this recipe in the early fall, so it is ready to drink when I make the Oktoberfest.

*Forrest Rogness  
Austin Homebrew Supply  
Austin, Texas*

### Ingredients

1/3 oz. Burton water salts  
3.5 lb. Telford or Mountmellick pale extract  
3.5 lb. Coopers or Alexander's amber extract  
1/2 lb. Paul's British crystal malt (40° Lovibond)  
1/2 lb. De Wolf-Cosyns Carapils  
5.2 AAU of Willamette hops (1 oz. of 5.2% alpha acid)  
5.2 AAUs of Fuggle hops (1 oz. of 5.2% alpha acid)  
White Labs British Ale Yeast (WLP-005)  
3/4 cup priming sugar

### Step by Step

Start with 2 gallons of water and add Burton water salts. Stir to dissolve. Heat water to 150° F and turn off heat. Steep grains for 15 minutes. Remove the grains and heat to boiling. Turn off heat. Add extract and stir to dissolve. Return



wort to boiling. Add the Willamette hops. Boil for 55 minutes. Add Fuggle hops and boil for 5 more minutes. Remove from heat and cool quickly to about 75° F. Pour into primary fermenter and add water to 5 gallons. Shake up White Labs yeast, pour in and stir. Leave it 5 days in the primary fermenter and then 5 days in the secondary. Then keg or bottle using priming sugar. Bottle condition for 3 weeks.

### HOPHEAD IPA

OG = 1.068 to 1.072 FG = 1.010 to 1.012 IBUs = 50

Full bodied, crisp with lingering hop flavor and nose, this is a must for any IPA fan. It tastes excellent with hardy meals or after fall hunts, but will stay refreshing if the hot summer weather lingers.

*Karin Baker  
Beer and Wine Hobby  
Woburn, Mass*

#### Ingredients

7 lbs. of Muntons  
dried light malt extract  
or 2 cans of light liquid malt  
(3.3 lbs. each)  
1/2 lb. CaraVienne malt  
1 lb. Munich malt  
1/4 lb. crystal malt  
17.9 AAU of Chinook hop pellets  
(1.5 oz. of 11.9% alpha acid)  
6 AAUs of Chinook hop pellets  
(1/2 oz. of 11.9% alpha acid)  
11.6 AAUs of Cascade hop plugs  
(2 oz. of 5.8% alpha acid )  
1 Burton water salt  
1 teaspoon Irish moss  
3 muslin bags  
3/4 cups corn sugar  
Wyeast 1056 (American Ale)

#### Step by Step

Crush grains and tie into muslin bag. Drop into brew pot with 2 gallons cold water and Burton water salts. Heat to 154° F. Let grains steep for 20 minutes, then remove. Remove pot from heat and stir in extract and 1-1/2 ounces of Chinook hops. Return to heat and boil 30 minutes. Add remaining 1/2 ounce of Chinook pellets and 1/2 ounce of Cascade plugs (in a bag) and boil for

another 15 minutes. Add Irish moss and boil for 10 more minutes.

Tie remaining Cascade plugs in the last muslin bag and boil for the last 5 minutes. Remove all hop bags. Place 3-1/2 gallons of cold water into primary fermenter, then add cooled wort. When temperature reach 65-70° F, add yeast. Ferment until it hits the target final gravity. Prime and bottle. Drink after 2 weeks, but wait 4 to 5 weeks for an even better treat.

### "FILLER'S" ESB

OG = 1.062 FG = 1.018 IBUs = 40

This is a Fuller's ESB knock-off with color, heft and staying power.

*Don Van Valkenburg  
Stein Filler's Brewing Supply  
Long Beach, California*

#### Ingredients

8 lbs. English pale malt extract  
(Telfords or John Bull)  
1 lb. crystal malt (75° Lovibond)  
1/4 lb. crystal malt (100° Lovibond)  
1/4 lb. crystal malt (150° Lovibond)  
6.7 AAU of Target hops  
(3/4 oz. of 8.9% alpha acid )  
4.1 AAU of Challenger hops  
(1/2 oz. of 8.2% alpha acid )  
4 AAU of Northdown hops  
(1/2 oz. of 8% alpha acid)  
White Labs English Ale yeast  
(WLP-002) or Wyeast 1968  
3/4 cups corn sugar

#### Step by Step

Steep grains in a covered sauce pan with 3 quarts hot water (at approximately 155 to 165° F) for about 20-30 minutes.

If using a small brew pot (at least 4 gallons), bring 1.5 gallons of water to a boil, turn off the heat, add malt extract, stir, then add liquid from grains above and enough water to bring volume up to a maximum of 3 gallons. If using a big pot, bring 4 gallons to a boil, turn off heat, add malt extract, then add liquid from grains above and water to bring to 5.5 gallons. Bring the mixture to a boil.

Total boil time is 60 minutes. When liquid comes to a boil, add 3/4

ounces of Target hops. Boil for 40 minutes and add Challenger hops. Boil 20 more minutes, turn off heat and add the Northdown hops. Cool the wort. Top off in fermenter to bring the total volume to about 5 gallons. When the wort has cooled below 80° F, add yeast. Ferment for 10 days at normal ale temperatures and age a few weeks in the bottle.

### DEPOT PUMPKIN BEER

OG AND FG FLUCTUATE DUE TO THE PUMPKIN. IBUs = 40

This beer is liquid pumpkin pie. Show up at Thanksgiving with some of this and it's sure to be a hit. As a bonus, you can make pie with the pumpkin after you use it!

*Brad Lowry  
Homebrewing Depot  
Milwaukee, Wisconsin*


#### Ingredients

8- to 10-lb. pumpkin (scooped, skinned and cut into two-inch squares)  
6.6 lbs. Muntons or John Bull British light malt extract  
1 lb. Briess amber dry malt extract  
1 lb. carapils malt  
1 lb. honey (orange blossom or light clover)  
5.4 AAU of Cascade hops  
(1 oz. of 5.4% alpha acid)  
5.3 AAU of East Kent Goldings hops  
(1 oz. of 5.3% alpha acid)  
3/4 tsp.  
cinnamon  
1/4 tsp.  
ground cloves  
1/4 tsp.  
ground ginger  
1/4 tsp.  
ground nutmeg  
1/4 tsp. pumpkin pie spice  
1/8 tsp. vanilla extract  
Wyeast  
American  
II (1272)

#### Step by Step

Steep carapils in 2 gallons water for 30 minutes. Remove grains,





bring water to boil, remove from heat and mix in extract until dissolved. Return to heat, bring to boil and add Cascade hops. Total boil is 60 minutes. After 15 minutes of the boil, add East Kent

Goldings hops. Boil 15 more minutes and add pumpkin. Stop timer until mixture comes to a boil again, then boil 15 minutes and add honey and spices. Boil 15 minutes longer, turn off the heat and remove pumpkin and hops from pot. (Save the pumpkin for tasty pies!)

Cool to about 100° F with 3 gallons of cold water in primary fermenter, top up to 5 gallons if necessary and pitch yeast at 70° to 75° F. Ferment 7 to 10 days at normal ale fermentation temperatures, transfer to secondary fermenter for two weeks and bottle with wheat dry malt extract as primer. Age in bottle for three weeks.

### CALIFORNIA COMMON

OG = 1.043 to 1.051 FG = 1.009 to 1.015 IBUs = 38

This American Steam beer (also known as California Common) will be copper in color and possess a pronounced hop character in both bitterness and aroma. It will look clear and brilliant when chilled and have high carbonation and good head retention.

*Jess Faucette  
Alternative Beverage  
Charlotte, North Carolina*

### Ingredients

5 lbs. Muntons light dried malt extract (DME)  
2 cups Briess Victory Malt  
1 lb. Briess crystal malt (120° Lovibond)  
9.7 AAU of Northern Brewer hops (1 oz. of 9.7% alpha acid)  
9.7 AAU of Northern Brewer hops (1 oz. of 9.7% alpha acid)  
1 tsp. Irish moss

1 cup priming sugar  
Wyeast 2112 (California Lager)  
or 2 packs dry Doric Yeast

### Step by Step

Put cracked malts in bags. Dissolve the DME in 2 gallons of warm water, stir several times over 20 minutes. Make sure DME dissolves completely. Add bags of malt, adjust heat to medium-high for 20 minutes and then turn up to achieve boil. As soon as it boils, remove the bags and add 1 ounce of Northern Brewer hops. After 25 minutes, add Irish moss. Boil 20 more minutes, add 1 ounce of Northern Brewer hops and then boil 2 more minutes. Remove from heat, cool wort, pour into fermenter and increase the volume to 5 gallons with water. Add yeast and starter. Liquid yeast ferments at 48° to 56° F and the dry version at 64° to 70° F.

### WINTER WARMER

OG = 1.062 FG = 1.016 IBUs = 24

This winter warmer is a crowd-pleaser whether snow flies or not. In fact, this big, bold ale with fruity notes from Cascade hops goes down nicely after a day of raking leaves.

*Tom Anderson  
T and M Homebrew Supply  
St. Charles, Missouri*

### Ingredients

4 lbs. Alexander's pale malt extract  
3 lb. Muntons plain light dry malt extract  
1 lb. Muntons plain wheat dry malt extract  
1/4 lb. DeWolf CaraVienne malt (24° Lovibond)  
1/4 lb. DeWolf CaraMunich malt (62° Lovibond)  
13.5 AAU of Hallertau Hersbrucker pellet hops (3 oz. of 4.5% alpha acid)  
12 AAU of Cascade pellet hops (2 oz. of 6% alpha acid)  
4.5 AAU Liberty pellet hops (1 oz. of 4.5% alpha acid)  
1/2 tsp. Irish moss  
Wyeast 1056 (American Ale yeast) or equivalent  
3/4 cup dextrose for priming

### Step by Step

Place the crushed grains in a grain bag and steep in 1.5 gallons of 150° F water for 30 minutes. Remove and discard spent grains. Slowly stir in all of the malt extracts until dissolved. Add an additional 1/2 gallon of water to the wort and bring the wort to a rolling boil.

Total boil time is 95 minutes. After the first five minutes, add the Hallertau Hersbrucker hops. Boil 75 minutes, then add the Cascade hops and the Irish moss. Boil 15 minutes and add the Liberty hops. Remove from heat and steep for 15 minutes.

Slowly pour wort into a primary, top up with pre-boiled or filtered, cold water and cool wort to approximately 68° F. Pitch yeast and ferment at approximately 68° F for 3 to 4 days. Rack to a secondary until clear (normally another 7 to 10 days). Prime with 2/3 cup of dextrose (corn sugar) and bottle. Allow to bottle condition for at least 10 to 14 days. Cool and enjoy.

### CRIMSON OKTOBERFEST

OG = 1.058 to 1.064 FG = 1.007 to 1.013 IBUs = 25

Crimson Oktoberfest is a copper colored, medium bodied, malty brew with a sweet toasted malt flavor and aroma. This style was originally brewed for Oktoberfest but is too good not to be consumed all year round!

*Phil Mathis  
Homebrew Adventures  
Charlotte, North Carolina*

### Ingredients

8 oz. Briess Victory malt  
8 oz. Briess crystal malt (120° Lovibond)  
8 oz. Briess CaraPils malt  
6 lbs. Muntons light dry malt extract (DME)  
4 AAU of Hallertau hops (1 oz. of 4% alpha acid)  
4 AAU of Styrian Goldings hops (1 oz. of 4% alpha acid)  
6.3 AAU of Spalt hops (1 oz. of 6.3% alpha acid)  
1 oz. Irish moss  
Wyeast 2124 (Bohemian Lager)

1 pkg. yeast starter: DME Light 6 ounce or Vierka Light Lager dry  
3/4 cup corn sugar for priming

### Step by Step

Dissolve DME in 2 to 2.5 gallons water (it may take up to 30 minutes). Place cracked grain in bag and add to dissolved DME. Turn burner to medium and allow grains to steep for at least of 30 minutes at 150 to 155° F. Turn up heat and remove grain bag just prior to boil. Add Hallertauer hops at the start of the boil. After 30 minutes, add Styrian Goldings hops, then Irish moss 5 minutes later. Let the wort boil 25 minutes, then add Spalt hops. Let boil two more minutes and remove from heat. Cover pot and cool wort to 70 to 80° F. Strain wort to primary through a filter funnel, then top off to 5 gallons and aerate well by shaking fermenter.

If using liquid yeast, follow instructions. If using dry yeast, sanitize a glass and proof (rehydrate) yeast in 95° F water, then cover with aluminum foil, wait 10 minutes and stir with a sanitized spoon. Wait 5 more minutes and pitch into cooled wort. You should have active fermentation within 8 to 36 hours. When fermentation is complete, transfer to secondary for 1 to 4 weeks or bottle as usual.

### INDY PUMPKIN BEER

OG = 1.052 FG = 1.012 to 1.015  
IBUs = 20

The dark copper color and the delightful aroma of pumpkin-pie spices that this ale offers make it just the right treat for October.

*Anita Johnson  
Great Fermentations of Indiana  
Indianapolis, Indiana*

### Ingredients

6.6 lbs. Coopers Light liquid malt extract  
8 oz. crushed DeWolf-Cosyns carapils malt  
6 oz. crushed DeWolf-Cosyns Caravienne crystal malt  
3 oz. crushed Briess crystal malt (40° Lovibond)

15 oz. can of solid pack pumpkin (not pumpkin pie mix!)  
6 AAU Crystal hops (1.5 oz. of 4% alpha acid)  
1 tsp. Irish moss  
1/4 tsp. nutmeg  
1/2 tsp. cinnamon  
1/2 tsp. vanilla extract  
1/2 tsp. pumpkin pie spice  
1/4 tsp. ground dried ginger  
1 pkg. Wyeast 1335 (British II) or White Labs Edinburgh Ale (WLP-028)  
3/4 cup corn sugar for priming

### Step by Step

Place crushed grains and pumpkin in a muslin bag and steep in 2 gallons of 150° F water for 30 minutes. Remove bag, gently rinse with hot water and discard grain bag. Add malt extracts and Crystal hops. Boil a total of 60 minutes, adding Irish moss with 20 minutes left in the boil. Add spices with 10 minutes left in the boil. Chill wort to 80° F, pour into fermenter and top up to 5.5 gallons with bottled spring water. Aerate well and pitch yeast.

Optional: transfer to a secondary fermenter when the bubbles in the airlock are 2-3 minutes apart. Taste the beer during transfer. If desired, add more spices to taste. Bottle when the bubbles are four minutes apart and the specific gravity is stable below 1.015. Prime with 3/4 cup of corn sugar.

### ALASKA OKTOBERFEST

OG = 1.058 FG = 1.017  
IBUs = 28

This German lager tastes full and smooth with just a pinch of hop bitterness. It's the perfect brew to celebrate clearing the driveway after an October snowstorm.

*Dave Snow  
Arctic Brewing Supply  
Anchorage, Alaska*

### Ingredients

6 lbs. British light malt extract  
3 lbs. Munich malt (10° Lovibond)

1/2 lb. crystal malt (120° Lovibond)  
11.7 AAU of Hallertauer hops (3 oz. of 3.9% alpha acid)  
Wyeast 2208 (German Lager) or White Labs German Lager (WLP-830)  
3/4 cup priming sugar

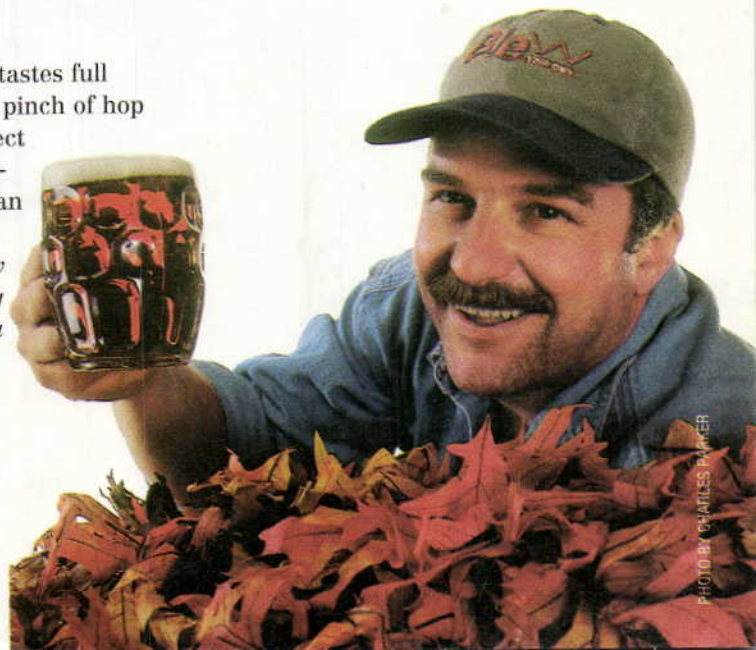
### Step by Step

Fill brew kettle two-thirds full, preferably with soft water, and turn on the heat. Put the grains in a muslin bag and add to water until temperature reaches 155° F. Turn off heat, place lid on kettle and steep grain for half-hour.

Remove grains and turn on heat until almost boiling, then remove pot from heat and add extract. Bring to boil and add hops. Boil for 60 minutes, remove hops and remove from heat. Chill wort.

When wort temperature is at 65° F, pitch yeast. (Use yeast starter for best results.) Ferment at 50° to 55° F until fermentation is complete and beer looks clear. Bottle and store in cool area. ■

*A former professional brewer at three Alaskan microbreweries (Sleeping Lady, Midnight Sun and Skagway), Dawnell Smith lives with her family in Anchorage, Alaska. She makes a living as a freelance author, mostly writing articles about beer, business and bambinos. She is a frequent contributor to BYO.*



# MR. CLEAN

by MICHAEL WHITE



# MICHAEL LIGAS OF MAGNOTTA BREWERY

is obsessed with sanitation. Here are his top tips for keeping your homebrew operation spic-and-span.

**I**n the brewery that Michael Ligas helped build, soft violet light reflects off eight-inch thick concrete walls. It is a special light intended to zap bugs that could conceivably sneak into the building.

The only thing is, insects are not much of a problem inside this brewery. Magnotta Brewery, built four years ago near Toronto, Canada with some of the best equipment available, may be one of the cleanest craft breweries in North America. The brewery's emphasis on sanitation might have something to do with parent company Magnotta Winery, which is among Canada's most award-winning wineries.

But it may have more to do with the person they hired as head brewer. Ligas, a homebrewer turned professional who attributes his zest for cleanliness to his training as a microbiologist, is known for his obsessive dedication to keeping his brewery free of contaminants. Case in point: Before entering the building, visitors are required to step through a sanitizing foot bath that kills any contaminants that may be clinging to their shoes.

It's a trait that he admits may seem excessive and that associates kindly chuckle at. But his success is no laughing matter. Beer sales have climbed at least 35 percent each year and all of the brewery's beers have won awards — 15 in all. The brewery's most recent accolade came at the World Beer Cup 2000 in Milwaukee, where the "Traditional Altbier" captured a bronze medal. But Ligas says he receives more gratification from customer reactions.

"My deepest sense of satisfaction comes from watching a customer leave our store with a case or two in their hands," he says. "Of all the beers out there, that person has judged ours as worthy of their hard-earned money. Nothing means more to a brewer."

PHOTOS BY MICHAEL WHITE



*Ligas stands behind his award-winning beers, including his Altbier, which won a bronze medal at the 2000 World Cup in Milwaukee.*

Ligas is not alone in his devotion to sanitation; the overwhelming majority of pro brewers run spic-and-span operations. Still, he's definitely earned the moniker "Mr. Clean." Ligas believes homebrewers can improve their beers' taste and consistency by using better sanitation techniques, many of which can be employed on a limited budget. By doing so, homebrewers can reduce the potential harmful effects caused by micro-organisms, which can cause your beer to appear cloudy or leave it with a phenolic character, among other problems.

Although homebrewers undoubtedly have heard some of these lessons before, they may never brew the same way again after listening to Ligas talk about sanitation. He is to beer cleanliness what a priest is to religion.

"Any brewer at any level can understand and apply the basic elements of good sanitation by paying attention to details, details, details," he explains. "We've all heard of the saying 'Relax, don't worry, have a homebrew.' It's a great saying from a great man [Charlie Papazian],

whom we all as brewers owe many thanks. But I couldn't relax, I guess.

"Personally, I could not brew until I had tended to every detail within my grasp, from all the raw materials to the process plan (how the mash and boil would create the particular style I was brewing). And in particular, I have always been obsessed with sanitation."

### **IT'S ALL ABOUT THE INGREDIENTS**

Before taking a look at how you can apply the basic elements of sanitation, let's examine how Ligas does it. For Ligas, the job of maintaining a clean workspace begins not with the brewing area itself, but with the ingredients. At Magnotta Brewery, the malt is naturally fumigated with carbon dioxide in the silo before it even enters the building, to make sure it is free of pests. The English and German malts cannot be fumigated in this fashion since they are bag lots. These specialty malts are, however, stored high and dry on a mezzanine where the malt mill is located. This area is kept clean through an additional safe-

guard: it has an ultra-violet bug zapping machine. The grain storage and mill area of the mezzanine is isolated to prevent any stray malt dust from drifting into the rest of the brewery.

There are many things homebrewers can do to replicate the level of cleanliness that Ligas achieves with his malt fumigation and storage. The best way is to buy malt from homebrew supply shops that take good care of the product and keep it fresh. The quality of the malt has a huge impact on the finished beer. Also, think twice about buying in bulk. Sure, you might save some money by buying in larger volumes, but will you really use all of the malt fast enough?

Also, take a close look at the way homebrew shops store the malt. Make sure the grains are stored in airtight containers and that the storage area is mostly free of grain dust. Also, taste it to make sure it doesn't have a stale flavor. You should have a little bit more luck in finding hops that are in good condition. Nevertheless, you will also want to be careful with this ingredient. A lot of homebrew stores repackage hops in two-ounce containers. If they don't vacuum-pack the product, the hops will not last as long.

Besides malt, another priority for Ligas is yeast. His focus on it began during his homebrewing days. Since he was a firm believer in using pure cultures of the proper strain for any given style of beer, he cultured his own yeast from plates and kept a library on slants. This may be hard for many homebrewers to replicate; if that is the case, one may want to buy pure liquid yeast from reputable sources.

Still, the experience of culturing his own yeast taught him valuable lessons about overall sanitation — lessons that extended to his other brewing practices. "Home yeast culturing means being thorough with your sanitation and cleanliness. It made sense to me to extend the same level of sanitation to the rest of my brewing," he says.

## ENEMIES ON LAND AND IN THE AIR

After he started thinking about how to improve his homebrewing environment, Ligas began viewing potential contamination sources in two ways: surfaces and air. Surfaces include counter tops, floors, utensils, tubing, fermenters and his hands, among other things. He considered what could contaminate the air, including things like open garbage pails, his mouth if he spoke or sneezed, and open windows.

Today, he still focuses on these two factors — the land and the air — but on a larger scale. The air inside the brewery is kept clean by using a sub-micron air filtration system that blows filtered air into the brewery and keeps the building under positive pressure. This means that whenever someone opens a brewery door, air moves out of the brewery rather than into it. And the floor of the brewery, even in the late afternoon, appears as clean as a

floor in Windsor Castle. Just to make sure, at the end of each day the brewery floor is mopped with a cleaning solution that contains, among other things, chlorine, bromine and potassium permanganate. The entire brewery floor is mopped, even if a given area was not actually used that particular day. Other less glamorous areas of the brewery are given equal attention. For instance, each day a Zamboni-like machine — similar to the contraption that cleans ice during hockey games — is used on the floor of the shipping area.

Obviously, most homebrewers will not have access to Zambonis or sub-micron air filters. So how do you keep potential contaminants out of your kitchen? By using Ligas' same principles of keeping the surfaces and air as clean as possible. Again, one needs to focus on the small details. Reduce the air flow in your kitchen when working with cold wort and pitching yeast by

closing the doors and windows. Scrub the surfaces thoroughly — and not just the ones in your immediate work area.

While Ligas may use sophisticated equipment to keep the air and surfaces clean, he also relies on tools that are considerably less expensive. He hangs all of his tools and brewing items (including clamps, gaskets, and site tubes) on a peg board. Hoses are placed on custom-made stainless-steel hose hangers. Leaving nothing on the ground means micro-organisms have no place to grow. This is something that homebrewers should keep in mind.

"How a homebrewer chooses to deal with these things really depends on their personal brewing system and environment," says Ligas. "I would simply say that wherever and whatever you are brewing, tend to your details."

He has always taken the details seriously, beginning with his home-



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brew. Joe Thivy, who owns a brewing and winemaking store in Hamilton, Ontario, used to be Ligas' neighbor. He chuckles when he recalls how scrupulously clean his neighbor was. "He was crazy about that stuff. And it remains his hallmark," Thivy said.

But it wasn't just a matter of wiping things down properly or sanitizing the buckets. Ligas always had a separate pail containing some kind of sanitizer solution (mild unscented bleach, iodine solution or peroxyacetic acid) that he used constantly as a hand dip and for wiping surfaces. He used another pail with either iodine or peroxyacetic acid to keep all equipment during brewing. He autoclaved (pressure cooked) any yeast culture media and dry items (like rubber bungs, air stones and culture jars) that were used in culturing yeast or brewing.

"I know it sounds rather excessive, but it wasn't difficult because I found it enjoyable," says Ligas.

"After all, my homebrew was a creation of love and personal pride. It paid off with excellent beers and many homebrewing medals.

"That was one reason why I decided to go professional. My roots in homebrewing and my approach to it were immeasurably valuable. A professional, commercial brewing environment opens even more doors that require even higher standards of cleanliness and sanitation. Being 'in the business' is a dream come true," he said.

When he did decide to go professional, it is hard to imagine him finding a more ideal situation. Magnotta Winery was started in 1989 by Gabe and Rossana Magnotta; in 1996, they decided to add a brewery and move to new headquarters in Vaughan, a few miles north of Toronto. Because the brewery was being custom built, Ligas had a chance to make sure that every detail of the brewery project met his high standards for sani-

tation. For instance, the thick walls of the isolated brewery and the positive air filtration system were used in part to block airborne wine yeast from entering the brewery.

Whether working in his kitchen or his brewery, Ligas has always tried to make his beers clean and flavorful. Judges seem to agree that his hard work has produced great results. But he doesn't see any reason why other brewers can't do the same. "Any brewer at any level can understand and apply the basic elements of good sanitation," he says. ■

*Michael White is a freelance writer. He lives in Stockton, California.*

*The Magnotta Brewery is located at 271 Chrislea Road in Vaughan, Ontario, Canada. It's housed within the company's winery; both are open for tours and tasting seven days a week. Call (905) 738-WINE or (800) 461-WINE. On the Web, go to [www.magnotta.com](http://www.magnotta.com).*

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## To Aer is Human

To run a healthy fermentation, you need to aerate your wort

by Chris Colby

**R**UNNING A GOOD fermentation is arguably the most important part of brewing a good beer. There are three key fermentation variables the brewer should control: the amount of yeast pitched, the fermentation temperature and the level of wort aeration. There also happen to be three good techniques that homebrewers can use to aerate their wort: shaking, splashing and injecting.

### Why Aerate?

Aeration is any process that introduces air into the wort. Before fermentation, chilled wort must be aerated in order to introduce oxygen. Since air is 21 percent oxygen, aerating wort also oxygenates it. This oxygen is absorbed by the yeast within a few hours and is used for "sterol synthesis." Sterols are molecules that are important to yeast's cell membrane health.

A well-aerated wort promotes yeast health. And you can't have a good fermentation without healthy yeast! Three indications of a good fermentation are minimal lag time, low ester levels and proper attenuation. Aeration minimizes the lag time before fermentation starts. If you use clean yeast, ester levels in the finished beer will be low. And your beer will reach a low final gravity if an attenuative yeast is used. Beer made from poorly-aerated wort, on the other hand, can be overly sweet and smell of esters. The fermentation will be sluggish and the beer may be slow to clear.

Keep in mind that the only time you should aerate your wort is after



*A well-aerated batch of wort will have at least a few inches of foam on top.*

it has been chilled and before the onset of fermentation. Oxygen is detrimental at all other stages of beer production and can contribute stale, cardboard-like flavors and smells. Before fermentation, the oxygen is absorbed by the yeast within a few hours and isn't in contact with the wort for long enough to cause a problem.

### How Much?

The amount of oxygen your yeast requires depends on wort gravity and the amount of yeast replication that will occur. Yeast in higher-gravity worts require more oxygen. Yeast's demand for oxygen increases steadily with gravity until about 1.060. Above this gravity, the need for oxygen increases sharply. Under-pitched worts also need more oxygen. The less yeast you pitch, the more they need to replicate before reaching a density high enough to ferment the wort. A good rule of thumb for pitching rates for ales is to use about one million cells

per five "gravity points." For example, a beer with a gravity of 1.045 (45 "gravity points") would need nine million cells.

A quick way to raise the right amount of yeast for pitching is to grow a starter in a container that's one-tenth the size of your fermenter. For a five-gallon fermenter, a half-gallon growler or two-liter soda bottle is about the right size. The gravity of your starter wort should be similar to the expected gravity of your beer. (For high-gravity beers, it's better to build bigger starters at lower gravities, so the yeast doesn't get tired before the main fermentation.) The recommended pitching rate for lagers is roughly double the ale rate.

Yeast generally need between 4 and 14 ppm of oxygen for a healthy fermentation. Since the vast majority of homebrewers don't have a dissolved oxygen (DO) meter to measure this with, you must rely on a variety of clues to indirectly gauge if aeration is sufficient.

Effective aeration can be roughly assessed by the amount of foam generated. In a well-aerated batch, there will be at least a couple of inches of foam on top of the wort. That said, the amount of foam can be affected by the malt bill; uneven aeration can also generate lots of foam. This makes measuring foam a fairly unreliable indicator of aeration success.

The best way to assess efficiency is by noting the lag time until fermentation starts, ester levels in the finished beer and the final gravity of the beer. A brew that starts fast, and yields a dry and clean finished

## Techniques

beer, received enough oxygen during aeration. A sluggishly fermenting beer that yields a sweet and estery concoction might not have received enough oxygen. (The yeast strain you use plays a role as well.)

### Where to Aerate?

The oxygen you introduce into your wort isn't the only source of oxygen for your yeast. Wort oxygen also can come from oxygen in the starter wort and, for extract brewers, oxygen in the dilution water. Also, trub can substitute for oxygen.

If you use starter wort, you should aerate it well. Thorough aeration will lower the amount of oxygen you need to introduce to your main wort. Aerating both the starter wort and the main wort is a good way to satisfy the oxygen demands of your yeast.

Retaining a bit of trub in the bottom of your fermenter decreases

the need for oxygen. Trub doesn't contain oxygen, but it helps yeast with sterol synthesis. A little bit of trub can help your yeast — but still, homebrewers should attempt to minimize the amount carried over from the kettle. Too much trub present during fermentation can contribute off-flavors to the beer.

The efficiency of aeration depends on wort gravity, wort temperature, and aeration techniques. Higher-gravity worts hold less oxygen at saturation. Unfortunately the yeast in higher gravity worts need more oxygen. So, for higher-gravity beers, you should aerate until the wort can't hold any more oxygen. For lower-gravity beers, the wort doesn't need to be saturated.

How you aerate your wort is also important. The techniques fall into three general classes: shaking, splashing and injecting. When choosing your aeration technique, you should consider your yeast oxy-

gen needs, starter size and the temperature of the wort.

### Method One: Shaking

Shaking a container of wort will aerate it. Shaking is not very effective for large volumes of wort, but works great for smaller volumes.

No extra equipment is necessary with this method. If you use your foot for support, you can rock the carboy back and forth vigorously until you have raised some foam. Be sure to get a good grip on the carboy and work up to speed slowly. A sloshing wort wave can jerk or twist the carboy from your hands.

Though a great way to get exercise, shaking is not the most effective way to aerate a carboy. The top of the wort will pick up air, but the bottom doesn't get any. Shaking works great for yeast starters.

The starter wort can be refrigerated overnight before it is pitched.

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When it's cold, a vigorous shaking will aerate the starter wort far beyond what shaking a five-gallon carboy full of room-temperature wort will. The agitation is much greater and the wort will hold more oxygen at the lower temperature.

If you make a step-up starter, you can shake the fresh wort at each step and keep the yeast in prime condition. For high-gravity batches, crash-cool your starter by refrigeration the night before you brew. Pour the fermented starter wort off the yeast sediment. Then pour the white layers of yeast into 500 mL of fresh, aerated wort a few hours before pitching to the main wort. This way, your yeast will absorb the oxygen before you pitch and "hit the wort running."

If you are an extract brewer, your dilution water can also be aerated by shaking. Water actually holds more oxygen than wort. Refrigerated, well-shaken dilution water can add a good deal of oxygen to your wort.

## Method Two: Splashing

You can aerate your chilled wort by splashing it around. This is more effective than shaking. But there are greater opportunities for the wort to become infected when splashing wort in the open air.

You'll need two (sanitized) fermentation buckets and, optionally, a large (sanitized) kitchen strainer. Pouring wort back and forth between two buckets will aerate it. Get a friend to hold a kitchen strainer above the receiving bucket. Straining the wort will further agitate it. A thick layer of foam will quickly develop when you aerate this way. Now, seal the bucket or siphon the wort to a carboy.

When splashing, care must be taken to avoid contamination. Don't transfer the wort between buckets in the same area where you crushed your grain. Grain dust harbors all sorts of bacteria and wild yeast that will spoil your wort. Also, don't touch the inside of your buckets or

the wort itself. Remember to brace the receiving bucket. An empty bucket can tip or slide suddenly when hit with a "wort waterfall." If you're siphoning your wort to a carboy, splashing the wort down into the fermenter will weakly aerate it.

## Method Three: Injecting

The most effective way to aerate your wort is by injecting air or oxygen directly into it. Injecting minimizes the chances of contamination.

The most common homebrew aeration set-up includes an aquarium pump, tubing with an in-line filter and an aeration stone. An aeration stone can also be connected via tubing to an oxygen tank.

Injecting air or oxygen into wort is simple. First, sterilize the tubing and aeration stone (usually made of a porous stainless steel). As the chilled wort transfers to the fermenter, air (or oxygen) is bubbled through the aeration stone and dissolves into the wort. Continue bubbling air through the stone until a layer of foam covers the wort. It usually takes 5 to 15 minutes.

The filter filters out dust and microorganisms in the air that could potentially contaminate the wort. Before using an aquarium pump set-up, check to see if it emits any tastes or smells with the air it pumps. To test this, fill two glasses of water. Aerate one glass for fifteen minutes with the aquarium pump. Aerate the other by placing another glass on top of it and shaking. Taste the water from both glasses. If the pump-aerated water has a rubber or petroleum taste or smell, get a different aquarium pump.

If a very high level of aeration is desired, pure oxygen can be used. However, high levels of oxygen can over-stimulate the yeast, resulting in foul-tasting fermentation byproducts. So be careful how much you inject. See the chart on the next page for guidelines. ■

*Chris Colby is a frequent contributor to BYO. He lives in Bastrop, Texas.*



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## AT-A-GLANCE GUIDE to proper wort aeration

Here is a quick guide to aerating worts of different gravities. Since there are a lot of variables in aeration, the only way to know for certain that aeration was sufficient is to taste the finished beer.

Gravity of Wort	Wort Aeration Method	Yeast Starter Aeration Method
1.030 to 1.045	Shake carboy <i>or</i> Splash wort <i>or</i> Inject with air for 5 minutes <i>or</i> Inject with oxygen for 1 minute	Shake starter wort
1.045 to 1.060	Splash wort <i>or</i> Inject with air for 10 minutes <i>or</i> Inject with oxygen for 2 minutes	Refrigerate, then shake starter wort
1.060 to 1.075	Splash wort <i>or</i> Inject with air for 20 minutes <i>or</i> Inject with oxygen for 4 minutes	Build a step-up starter, refrigerate and shake wort at each step
1.075 and higher	Inject with air for 40 minutes <i>or</i> Inject with oxygen for 8 minutes	Build a step-up starter, refrigerate and shake at each step, crash cool, pitch yeast to 500 mL fresh, aerated wort

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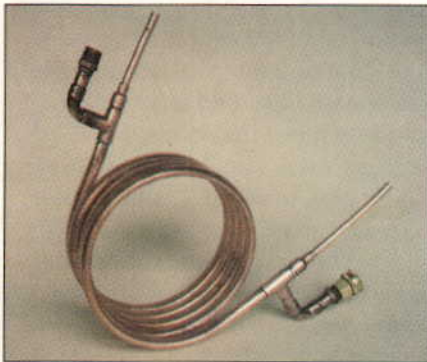
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## Just Chill

Build your own counterflow wort chiller

by Thom Cannell



PHOTOS BY THOM CANNELL

Behold the finished counterflow wort chiller with garden hose adapter.

**R**ube Goldberg would have loved homebrewers. We do crazy things to cool our wort, like carrying a five-gallon pot of boiling liquid from the kitchen to a snowbank. Or setting the kettle in a bathtub full of ice water and waiting hours for the stuff to cool.

No matter what method you use, the fact remains: Once you've boiled your wort, it must be chilled to proper pitching temperature and the faster the better! Quick chilling retains the flavor of finishing hops in the beer and promotes cleaner fermentations, better head retention and more stable beer. You can cover the pot and wait for nature to take its course, but that increases the danger of contamination. We need a quick way to cool our wort.

### The heat exchange principle

A heat exchanger works by moving heat from one place to another. The radiator on your car is a good example of a heat exchanger. In homebrewing, a common heat exchanger is an immersion or counterflow wort chiller.

An immersion chiller is a coiled

copper pipe that attaches to a faucet. You plunk it into a pot of wort and turn on the cold water. They're inexpensive, easy to construct, simple to operate and will cool five gallons in less than thirty minutes (see "Five Easy Projects," September 2000). But they aren't very sexy, or really quick. A counterflow chiller is much faster. It keeps the kettle closed and lets you start running off wort moments after the flame is extinguished.

A counterflow chiller consists of two separate liquid systems. The inner pipe transports hot wort from your boil kettle to the fermenter while the outer pipe transports cooling water. The heat flows from the warmer liquid to the cooler as the two temperatures seek equilibrium. The pipe full of hot wort is surrounded with a jacket of cooling water and the hot wort and cold water flow past each other in different directions. This is where the term "counterflow" comes into play. The tubing keeps the two liquids separate but allows the cold water to suck heat out of the hot wort.

After pricing some commercial counterflow chillers (deluxe models cost more than \$100), I created my own prototype with the materials at hand. I started with two sizes of copper pipe, 5/8-inch inside diameter and 1/4-inch inside diameter left over from our keg conversion project (see "From Keg to Brew Kettle" September 2000). I straightened each pipe so I could slip one inside of the other. It's all too easy to kink or distort soft copper pipe, particularly the larger tube, so be careful.

It's easiest to gently clamp one end between two large blocks of

wood, then apply light pressure to unwind and straighten each tube. Next, I took the tube to a large workbench and gently pressed out most of the curves, except the last 2 to 6 inches. The ends are very hard to straighten and cutting them off is the best solution.

With both pipes now "straight," I forced the smaller into the larger. That gave me a ten-foot outer pipe 5/8-inch in diameter and an eleven-foot inner pipe of 1/4-inch inside diameter that was six inches longer at each end. At this point I realized 3/4-inch pipe would have made the job easier but it is a little harder to find, as are the other fittings.

### SHOPPING LIST:

- 20 to 50 feet of soft copper pipe (Type L), 3/4-inch or 5/8-inch outside diameter (3/4-inch preferred)
- 20 to 50 feet of soft copper pipe, 1/4-inch inside diameter
- 2-1/2-inch copper T (assuming 5/8-inch pipe)
- 2-1/2-inch to 1/4-inch reducers (assuming 5/8-inch pipe)
- 2-1/2-inch elbow (assuming 5/8-inch pipe)
- 2 fittings: male or female with straight pipe thread
- Solder, flux, tubing cutter, sandpaper or steel wool and propane torch
- Extras: Nylon barb to MIP adapter 3/8-inch x 1/2-inch
- Flare to female pipe coupling 3/8 x 1/2-inch and 3/8-inch short rod nut
- Garden hose shut-off valve



*A tube within a tube: The 1/4-inch inside diameter copper tubing inside the 5/8-inch inside diameter tubing.*



*Here is a "dry fit" of all parts including a male straight pipe and the very important garden hose adapter.*

When selecting your copper tubing, I recommend the following Website: the Copper Tube Handbook ([www.copper.org/tubehdbk/](http://www.copper.org/tubehdbk/)). I used Type L tubing. (Types K, L, M, DWV and Medical Gas tube are all designated by ASTM standard sizes, with the actual outside diameter always 1/8-inch larger than the standard size designation.)

Now it's time to wind the coil. Any cylindrical form will do, like sonotubes used for concrete forms or large pipe. It needs to be sturdy and at least 6 inches in diameter. Or you could go to a metal shop; they'll have machinery to do it for you.

I started about one-third along the length of the tubes, pulling both ends up and around the bending form. Then I slowly wound the tube into a coil. It wasn't too difficult, but the force required to wrap the pipe caused it to flatten into an oval shape. An engineer at a metal-fabrication company told me this would

not significantly reduce efficiency.

At the end I had a splendid coil, if a bit flat. As shown in the accompanying photos, a "T" fitting allows the water to flow in at the base and the inner wort tube to pass through. To cap the water tube, yet allow the wort tube to exit, I used a reducer fitting (but you might get away with an ordinary cap).

The reducer presented one minor problem: It has a "stop" molded into the center to prevent the smaller pipe from extending into the larger pipe. So I used a round file to remove that ridge, plus enough extra metal to make it relatively easy to slip the reducer over the wort pipe.

At the base (center) of the T, I attached a right angle and a pipe fitting to each end. These are connected by lengths of ordinary 1/2" hard copper water pipe. The lengths affect spacing and are pretty much arbitrary. I suggest laying the

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incomplete coil in whatever position your brewing setup requires and making decisions based on what works best for you.

I chose male fittings and fitted a male straight (not tapered) pipe fitting to the end, and used an ordinary male pipe-to-water hose adapter to attach a common garden hose. You can use any of a variety of fittings: female pipe, barb fittings or quick disconnects. And since the parts are soldered on, no decision has to be final. You can even pick a fitting that allows screw-on or screw-in adapters.

My wort input-output pipe was the same 1/4-inch inside diameter by 3/8-inch outside diameter pipe size that fits ordinary racking and bottling hose. Vinyl hose will work to get the wort in and out, but isn't really safe. Heavier hose reinforced with braid is safer and a continuous copper tube would be best, but much more cumbersome.

I decided to use soft tube, but then had to consider a flare or compression fitting coupled to a barbed fitting. Or you could add quick disconnect fittings. There are many different possibilities.

Construction is straightforward: cleaning each fitting with sandpaper or steel wool, fluxing with the proper flux and using the proper solder. For brewing or any food-service use, you must use a lead-free solder (see "The Hole Story," *Summer 2000*). We used Staybright 8 solder (535° F melting point) and Stay-Clean liquid flux. Both are available from Harris Welco (call 800-733-4043 for a local dealer).

Adding up all the tube-straightening, cutting, fluxing and soldering, the entire project took less than two hours. Fiddling around and adding different fittings took about another half-hour.

Why do I call my ten-foot counterflow chiller a prototype? Because

I don't think it cools wort fast enough, though one commercial model from St. Patrick's of Texas in Austin (512-989-9727; [www.stpats.com](http://www.stpats.com)) is similar in length. Using 66° F water, our wort chiller took 212° F wort down to 76° F at a flow rate of less than five minutes per gallon. That's 20 to 25 minutes to chill an average batch. The longer a counterflow chiller is, the more effective it is at cooling.

So it's up to you to pick your own length and decide what is more important. Our ten-foot chiller is slower than a twenty-foot model would be. You can speed up cooling by using more cooling water. You can use less cooling water by reducing wort flow and still get the required pitching temps, or get maximum temperature drop using slow flow and lots of cold water.

By way of comparison, the MAXIChiller from Precision Brewing Systems in Staten Island, New York,

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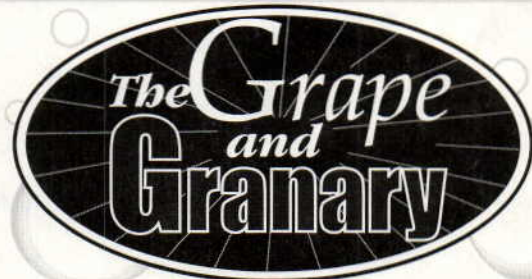
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## THE PHILCHILL OPTION

THERE IS AN ALTERNATIVE to all of this bending and soldering that can produce a satisfactory counterflow chiller from twenty-five feet of copper tube, a similar length of ordinary garden hose and 30 minutes of your time. Listermann Manufacturing, home of "Phil's" products, supplies everything but a knife, the copper tube and garden hose for under \$20.

Cut off both ends of the garden hose near the end and push the straightened copper tube through it, then wind it around a form. Use supplied fittings to assemble the counterflow chiller.

Listermann Manufacturing is based in Cincinnati, Ohio. Call 513-731-1130 or go to [www.listermann.com](http://www.listermann.com).

(718-667-4459; [www.pbsbeer.com](http://www.pbsbeer.com)) costs \$114. Our project will cost half that but MAXI promises to cool five gallons of wort in ten minutes using larger tubing. Perhaps MAXI is a superior product, as may be the similar outer-copper inner-stainless counterflow chiller from St. Patrick's. As always, the decision is all about time, materials, satisfaction and total cost.

### Keeping it Clean

Sanitizing your wort chiller is critical. It has to be clean inside and harbor no bacteria, fungus, wild yeast or mold. That means cleaning every time you finish brewing. Clean your chiller by running several quarts of boiling water through it after you've transferred all the wort to the fermenter.

I have several suggestions for sanitizing. If your chiller is all metal you can bake it or boil it. If there is soft material involved, like rein-



*PhilChill Phittings and everything but the tools and copper piping.*

forced vinyl tubing, you can dump the whole thing into a sanitizing cleaner (such as iodophor, One Step, B-Brite or Beer Line Cleaner) or pasteurize at 170° F in the hot liquor tank. Some brewers clean the chiller with hot water then fill the wort tube with a metal-safe sanitizing agent, like iodophor. Then they cap the ends tightly and store it full of sanitizing liquid. ■

*Thom Cannell is a homebrewer and writer in Lansing, Michigan.*

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# Cidermaking

## Easy Hard Cider

How to ferment fresh apple juice at home

by Scott R. Russell



*Sweet, tart, astringent or aromatic, most varieties have something to contribute to your hard cider.*

**A**S LONG AS HUMANS HAVE known about apples, they have probably been making cider. As with wine, beer, mead and other alcoholic beverages, the first hard cider was probably an accident. Someone had some fresh apples or apple juice, left it sitting too long and when they finally retrieved it ... surprise! We've come a long way since then, improving and refining how we make hard cider. Today you see more and more commercial ciders stocking supermarket shelves.

Though there's more to making

hard cider than leaving a jug of store-bought cider in the doghouse for a few months, it's quite an easy process. If you want to make your own hard cider, the first decision is: should you buy pressed cider or press your own? There are pros and cons to both options. The main advantage to ready-pressed is simplicity. It's already cider; all you need to do is ferment it and wait. The downside is, with the majority of store-bought ciders you never really know what you're getting. Pre-pressed may be a "generic cider," a blend or a single variety. It also may contain preservatives that will inhibit yeast activity. Ideally, you should buy your cider directly from an orchard or farmer's market, someplace close to the source so you can know exactly what you are getting. Pasteurized cider, as long as it isn't chemically preserved, will have a longer shelf life in the refrigerator. Unpasteurized will start to ferment on its own very quickly if left warm — and within a few days if refrigerated. If the cider is not pasteurized and you're not using it right away, it needs to be stored at 30° to 40° F.

Pressing your own cider requires a great deal more time and energy. The advantage is you can control the freshness and the varieties of apples you use. But pressing takes hours of work, not to mention picking, sorting and washing the apples. And I'm guessing not many of you own or have access to a press. Sometimes you can arrange to get "custom pressed" cider from

an orchard. For a small fee you can buy the apples and use the orchard's press.

### How do you like them apples?

Whether you're pressing your own or buying pre-pressed juice, it's important to choose your apples wisely. Look for well-washed whole, sound and ripe fruit. Avoid using over- or under-ripe apples, "drops" or those that appear damaged. It's also important to get just the right balance of varieties.

There are four basic categories of cider apples: sweet, acidic (tart), aromatic and astringent. Sweet apples include Baldwin, Cortland, Delicious and Rome Beauty. Acidic apples include Northern Spy, Granny Smith, Winesap and Pippin. Macintosh, Fameuse and Pippin are the most popular aromatics. Wild apples and crabapples often have higher tannin and acid levels and are considered to be astringent.

The best cider is made from a blend of varieties and characteristics. Bland, tart and sweet tastes should balance each other out. A good blend for cider-making consists of 50 percent sweet, low-acid apples (a neutral base that will blend easily with the more complex flavors), 35 percent acidic or tart, 10 percent aromatic and 5 percent astringent. For information about what's available in your area, consult your local orchards.

### Nature or Nurture

Next you need to decide if you want to ferment your cider sponta-

## Cidermaking

neously or pitch yeast. The wild yeast present on apple skins is enough to get fermentation going, but the cider is vulnerable to acetic acid-producing bacteria that will turn even the best cider into vinegar if left too long. It's preferable to pitch yeast. Any champagne wine yeast, dry or liquid, will work. Try to aerate the must and let it rest for 24 hours before pitching the yeast.

**The home cidemaker can, and should, use the same basic equipment used in brewing beer. Since no cooking is involved, you won't need a kettle or a heat source.**

You may need to add sulfites to the juice to rid it of any wild stuff before you add a "proper" yeast culture. Sulfites pre-sterilize your cider and ensure clean fermentation. One or two campden tablets per gallon will help eliminate potential bacteria or wild yeast.

Now it's time to decide if you

want to fortify it or leave it natural. Pure apple juice, fresh-pressed, will give you an OG of around 1.045 to 1.050. You can add as much sugar, honey, maple syrup, malt or other juices as you want, testing and adjusting until you reach your desired strength. Remember that sugar will ferment quickly and add "hot" flavors. Hot flavors are unpleasantly sharp and tart and dis-

guise the intended fruit flavors. Honey will take longer to ferment and will contribute honey-like flavors. Other juices or concentrates will, of course, add the flavors of the fruit. The higher you make your original gravity, the more powerful your yeast will need to be.

Original gravities vary in cider.

U.S. varieties tend to be 4.5 to 6 percent alcohol while English still ciders are closer to wine strength at 10 to 13 percent. French and Quebecois ciders are generally lighter at 2.5 to 4 percent. It helps to add a yeast energizer to improve fermentation efficiency if you add honey or maple syrup.

Do you like your cider dry or sweet? If you let the cider ferment as it wishes, it eventually will end up with a gravity of less than 1.010, which will be fairly dry. To keep it sweeter, especially if it will be a still cider, test the gravity daily until it reaches the desired endpoint and add winemaking sulfites to stop fermentation. You can also add back some sugar to taste, if you have stopped fermentation, to increase the residual sweetness.

Cider can be made still or bubbly. If you're after still cider, bottle in wine bottles as soon as fermentation and aging are complete. To



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make sparkling cider, prime it just as you would beer (7/8 cup corn sugar for 5 gallons) and bottle in reliable glass bottles (champagne bottles) with good oxygen-barrier caps. Age in the bottle a few weeks at a cool cellar temperature. Making champagne-type ciders is much more involved.

For champagne-type cider, you need to leave it longer (six months to a year) and you need to settle and remove the sediment. This involves storing the bottles neck down in crates until the sediment drops, then removing the settled lees using a technique called "degorgement." Degorgement is an elaborate process of freezing the top end of the bottle and the cork, then popping the top off and letting the gas and foam force the sediment out of the bottle. The trick is to do this without losing too much of your hard-won cider. Any lost liquid is

replaced using cider from the same batch and the bottle is restopped. In another two weeks, it is finally ready for drinking.

The home cidemaker can, and should, use the same basic equipment used in brewing beer: 5.5 to 7-gallon plastic primary fermenter with airlock, 5 to 6-gallon glass carboy for secondary fermentation and aging, along with the assorted bottling (tubing, capper and caps) and testing accessories (hydrometer). The good news is: Since no cooking is involved, you won't need a kettle or any source of heat.

On the next page you'll find two recipes: a basic farmer's market cider and a semi-traditional, sparkling hard cider that hails from Northern New England or the province of Quebec. This recipe makes a wonderful cider but Fameuse and Chenango apples can be hard to find.

## TAKE YOUR PICK

### NORTH AMERICAN VARIETIES

**AROMATIC** (provide "nose"):  
Golden Russet, Gravenstein, McIntosh, Red Delicious, Ribton Pippin, Roxbury Russet, Wealthy.

**ACIDIC (TART)** (provide balance):  
Cox's Orange Pippin, Eospus Spitzenberg, Granny Smith, Jonathan, Newtown, Northern Spy, Rhode Island Greening, Wayne, Wealthy, Winesap.

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CIRCLE 42 ON READER SERVICE CARD

## Read All About It

*"Cider: Making, Using and Enjoying Sweet and Hard Cider" by Annie Proulx and Lew Nichols (Storey Books, 1997).*

*"The Art of Cidermaking" by Paul Correnty (Brewers Publications, 1995).*

*"Cider, Hard and Sweet: History, Traditions and Making Your Own" by Ben Watson (Countryman Press, 1999).*

*"Apples" by Roger B. Yepsen (W.W. Norton & Company, 1994).*

*"The Book of Apples" by Joan Morgan, Alison Richards and illustrated by Elisabeth Dowle (Ebury House, 1993).*

### Basic Farmer's Market Cider

OG = 1.060 FG = 1.010

#### Ingredients:

- 5 to 5.5 gallons fresh-pressed apple cider
- 1 tsp. winemaker's acid blend
- 1 cup to 4 lbs. sweetener (sugar, honey, maple syrup)
- 1 quart yeast slurry (champagne wine yeast)

#### Step by Step

Put 5 to 5.5 gallons cider (whatever variety or varieties you can find) in a 6-gallon fermenter (the same one you use for beer will do). Add winemaker's acid blend and enough sweetener of choice to increase your gravity to the desired level. Then mix it well and pitch your yeast slurry.

Ferment at warm temperatures (68 to 70° F) for three to four weeks, or until all the visible signs of active fermentation cease. Rack to a secondary fermenter (glass carboys are preferred, if you don't have a clean oak cask handy). Then condition at 55° F for at least six to eight weeks.

Bottle as is for still cider, or

prime with 1/3 to 7/8 cup of corn sugar for sparkling or effervescent cider. Bottle condition two to three months in a dark cool (50° F) place.

### New England Cider

(5 gallons)

OG = 1.060 FG = 1.010

#### Ingredients:

- 3 gallons fresh-pressed Macintosh cider
- 1 gallon fresh-pressed Fameuse cider
- 1 gallon fresh-pressed Chenango cider
- 1 tsp. winemaker's acid blend
- Enough maple syrup to bring OG up to 1.060 (about 1 quart, usually)
- 1/2 tsp. yeast nutrient
- 1 pint slurry champagne yeast
- 7/8 cup corn sugar for priming

If you have access to a press, you should choose your varieties to blend; preferably 60% Macintosh, 20% Fameuse and 20% Chenango. Press enough to get 5 to 5.5 gallons, and proceed as above. ■

*Scott Russell is the author of several excellent homebrew books.*

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# Last CALL

## Turning the Tables

The true confessions of a dedicated beer wife

by Beth Fuchs  
Albuquerque, New Mexico



I'm a research engineer — and I'm a brewing wife. Not the kind of brewing wife that you might expect. When people hear the phrase "brewing wife," they might envision a woman helping her husband brew or a woman who can't get her husband's attention because he is always brewing. Well, my husband doesn't brew. I do.

My husband doesn't even drink beer. He doesn't like it and he never has. Instead, he prefers hard alcohol, although he does say that the best beer he's ever tasted has been beer that I've made.

I've been brewing for about two years. It all began with an innocent birthday gift. I bought a homebrew kit for a friend of mine who loves to drink good beer but he didn't have the kitchen space to brew in. Somehow — I am not exactly sure why — it all ended up in my house.

The next thing you know, I became the brewmistress for an extended group of friends. My

friends buy all of the necessary ingredients and bring the stuff to my house and I brew the beer for them. I usually brew about once a month. My kitchen is perpetually filled with all sorts of beer-making paraphernalia.

In the short time that I have been brewing, my husband has only really complained about it once, and that was because the stove was so cluttered with brewing stuff that he couldn't find any space to prepare his dinner. He is normally very supportive of my habit and always puts up with my requests ("Honey, I can't get the lid off my plastic fermenter, could you do it?") He doesn't even seem to mind when I invite some of my brewing buddies over to the house, although this is beginning to be a regular occurrence.

In the beginning, I tried to involve him in my hobby. The first time I tried homebrewing, we decided to put half of the batch into mini-kegs. We got the kegs from the homebrew supply store but they didn't give us detailed directions on how to use them. We put the priming sugar in and then we thought, "What do we do now?" My husband came up with an idea: "Put the bung on, shake it up and let it go," he said. So that is exactly what we did and it exploded all over the ceiling. That was the first and last time my husband was involved in the brewing process.

My friends help me brew sometimes, but technically I'm the primary brewer and they're just there for moral support. They sometimes

even buy toys for the brewery (my kitchen, that is). Most recently, they bought me a complete setup to make a "pseudo lambic."

People are often surprised when they find out that I am a woman who is interested in homebrewing. But I know a few female graduate students at the university where I work who brew. Women students in engineering are almost as unusual as women brewers, so I guess it just goes hand in hand.

I still brew in my kitchen, but my friends are making plans to buy me some gear for backyard brewing. This is good news to my husband. I am also a cook, so I do everything, make the food and make the beer. I have a New Year's party every year and people come just to eat and try my beer.

My specialty is cherry wheat. That's what my friends always want me to make, ever since I made a test batch one New Year's Eve and it was consumed within an hour. It just disappeared.

Now that I've enlightened you with my tale, the next time you hear the term "brew wife" you won't assume the woman in question is a brewer's widow. Instead of envisioning a neglected wife waiting for her husband to come out of the basement, picture a dejected husband trying to find an open burner to cook his canned beans on. ■

*Beth Fuchs works at the University of New Mexico as a research engineer. She lives in Albuquerque with her non-brewing husband.*

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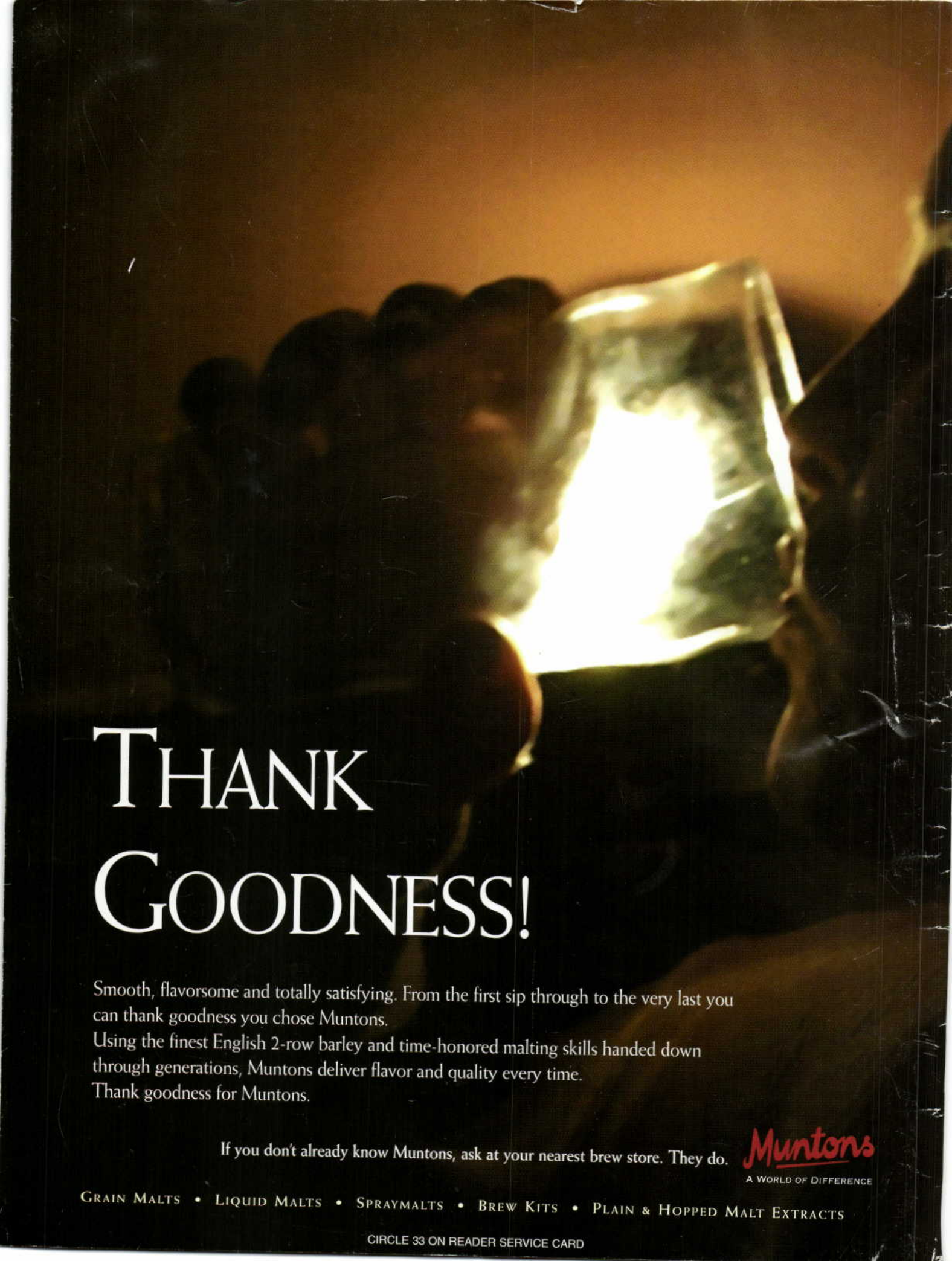
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