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Brew Your Own

OCTOBER 2001, VOL.7, NO.8

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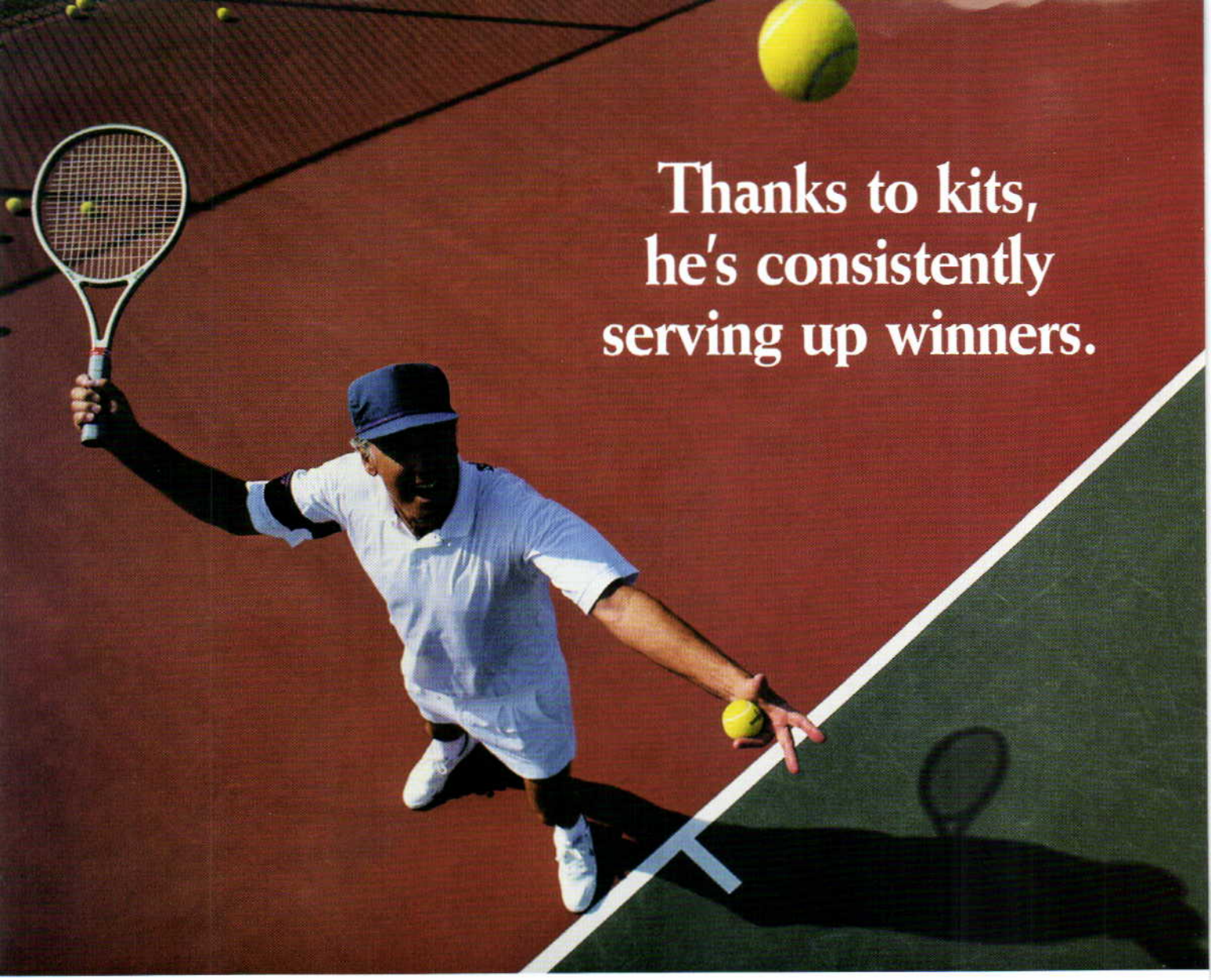

Thanks to kits, he's consistently serving up winners.

"It tasted just as good - if not better - than many a pint I've drunk in London pubs."

Richard Neill
'Weekend Telegraph' (April 99)

"I wouldn't have believed that a kit beer could be so good"

Roy Bailey - Beer Correspondent
CAMRA's 'What's Brewing' magazine (April 2000)

"It resulted in as good a home-made beer as I have ever tasted"

Maximum 5-point rating in kit review
'Bizarre' magazine (September 99)

This man is a dedicated brewer. But he also loves to play tennis.

More and more his brewing was keeping him at home when he wanted to be out in the sun. Then he discovered Smugglers Special Premium Ale, Old Conkerwood Black Ale and Midas Touch Golden Ale - the Premium Gold range of brewkits from Muntons.

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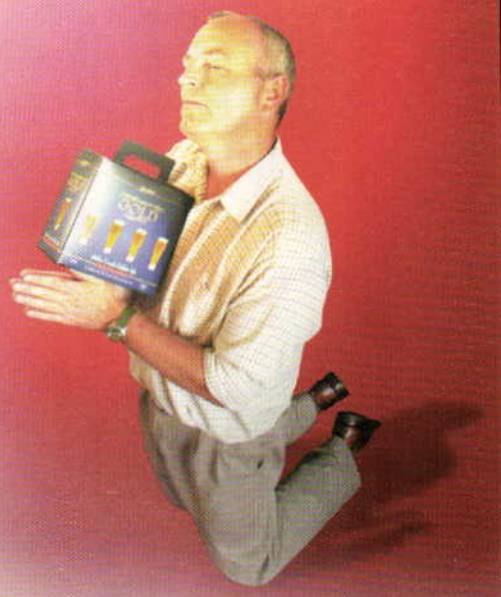
CIRCLE 26 ON READER SERVICE CARD

Forgive me father, for I have sinned.



Yes, it's a great hobby but surely there's more to life than homebrewing? Beer lover Roger Bacon comes clean and admits to using kits.

I confess! Those empty kit tins you saw in the trash were mine. But do you know something? The beers tasted great! Maybe it's years of thinking the only way to a masterful brew is the hard way - full grain mashing. Maybe I was just kidding myself. But somehow I don't think so. They just tasted really, *really* good.

It all started when I snuck into my local homebrew store a month or so back. I was there to buy my usual mash grain but I committed the ultimate sin. Maybe it was the attractive packaging that lured me. Before I could stop myself I was busily reading the notes on a Midas' Touch Golden Ale Kit from Muntons. And it all sounded so easy and delicious. And my life had been so complicated of late. OK call me weak willed but I just thought "do it! If it turns out bad, no one will ever know." My ordeal wasn't over. The next thing I had to do was try and convince Brad, the store owner, that the kit was for somebody other than me. See, Brad is a member of the same brewing circle as my father and the last thing I wanted was a vicious rumour about my brewing antics reaching dad's ears! But even Brad reckoned the kits were great. He told me he'd been using them for the past two years and he thought the whole range tasted superb.

Now I was really confused. If guys like Brad were using kits then surely they must be OK.

So as soon as I got home I had a quick look at the instructions and decided to get the brew underway. It was so easy. I put the cans in some hot water to soften the concentrated wort inside. While this was happening I boiled up 6 pints of water, sterilized my fermenter, mixing spoon and jug. I added the boiled water to my fermenter, added the contents of the cans (which poured in easily) stirred them together and then added a further 34 pints of cold tap water. When this was fully stirred I added a sachet of Premium Gold Yeast, sealed the lid of the fermenter and that was it. It took no more than twenty minutes from start to finish. I remember thinking "This will never taste any good, it's just too easy."

How wrong I was. A few days later I lifted the lid and was greeted by the warm, sweet smell of a quality brew in the making. Years of mash brewing had taught me the signs and every good brewer knows when something exceptional is developing.

Now I was beginning to get very excited about the Midas' Touch Golden Ale that gurgled like a baby in my fermenter. After two weeks when all was still, I carefully transferred the wort into the barrel. The beer was already a gorgeous rich golden color and it had a delicious aroma of bitter hops and top quality English malt. But I still had to wait. I killed time by reading. I took my wife to the movies. I helped the kids with their homework! I was a free man and yet I was obsessed with the contents of that barrel. It was like being a convict counting down the days to freedom.

And then the day came. It was ready. All was quiet. I'd selected my favourite tasting glass from the kitchen and made my way to the basement where my Midas' Touch Golden Ale was waiting. I polished my glass, held it under the spout and opened the tap. The sound of the beer as it foamed from the spout was soft yet energetic. As the glass filled I could see the beautiful golden color collecting at the bottom of the glass as the bubbles rose to form a creamy head. I closed the tap and held the brew to the shaft of light that fired into the room. The beer was clear and bright and I could wait no longer. First my nostrils were met by an intoxicating hoppy aroma. Then my lips met the soft caress of the creamy head and I was fully rewarded with the delicious taste of the beer itself. The clean, malty sweetness was beautifully balanced with bitter hops. The beer was light yet strong, delicate yet decisive and wholly refreshing. I stopped drinking and as I admired the color once again I was astounded by a wonderful aftertaste that glowed from the back of my tongue. Kit or no kit this beer was something very special indeed. I beckoned my neighbor over from his yard. "Try this Tom" I said. "Wow" he said, "I haven't tasted beer like that for years. Is it your father's recipe?" I did not answer him. I just smiled and poured us another glass.

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Volume 7 Number 8
OCTOBER

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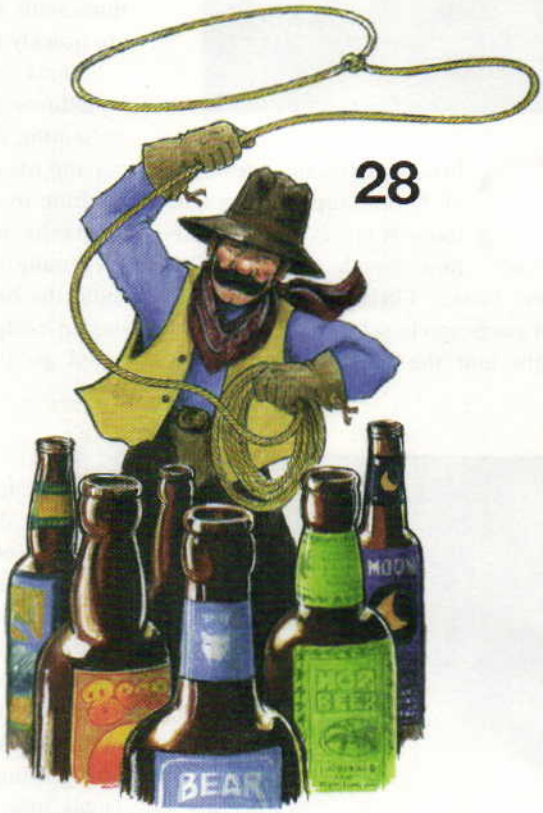

Where to find it

Cover photo: Charles A. Parker/Images Plus

Horst D. Dornbusch was born and raised in Düsseldorf, Germany, where he grew up on a wonderfully sustaining diet of traditional altbier, rye bread, sausages and spicy mustard. In 1969 — by then a student of 22 with a Fulbright grant in his back pocket — he chucked the familiar comforts of home and boarded a boat for a voyage across the Atlantic Ocean to North America. He started homebrewing as much out of nostalgia as out of necessity. "If you wanted a decent beer in North America in those days, you had to make it yourself," he says.

In 1995, after a 20-year career in broadcasting and publishing, Horst founded a small microbrewery in Massachusetts. In 2000, he won a bronze medal for his altbier at the Great American Beer Festival in Denver, Colorado.

Horst is the author of two books in the Classic Beer Style Series by Brewers Publications: "Altbier" (1998) and "Bavarian Helles" (2000). He also wrote "PROST! The Story of German Beer" (Brewers Publications, 1997). Horst lives and brews in Manchester-By-The-Sea, Massachusetts. His feature story on hops begins on page 32.

Chris Graham, the president of Fermentap in Concord, California, is a valuable new member of the *BYO* review board. Chris started brewing eight years ago in school when a friend bought him the most basic of basic homebrew kits. He soon fell in love with the hobby and proceeded to make some of the worst beer ever imaginable. Eventually a passion for the process and the subsequent connections with knowledgeable homebrewers quickly turned his beer around.

Chris worked in five different homebrew shops, from San Francisco to Seattle, on nights and weekends to expand his experience in the hobby. In addition to moonlighting at homebrew shops, he worked at a local brewery, eventually getting the chance to help build the brewhouse. He helped brew, design recipes and, most importantly, acted as a tasting consultant at E.J. Phair Brewery in Concord, California.

With an aptitude for being a gearhead, Chris quickly gravitated toward equipment.Three years ago, at the age of 24, he acquired Fermentap from Jim Martin and found his own niche in the homebrew world. Fermentap is a supplier of innovative brewing products, such as the Fermentap Valve Kit. His company has now grown to distributing and manufacturing equipment and supplies for both homebrew shops and breweries.

When not working, which we hear he does all the time, Chris loves to mountain bike, wakeboard recklessly, and — oh yeah — brew.

Chris White, Ph.D. founded White Labs in 1995 after conducting years of research and development on an entire library of brewers yeast strains from around the world. Chris received an undergraduate degree in biochemistry from the University of California at Davis, where a course in brewing and malting science led by Dr. Michael Lewis inspired him to start brewing. He relocated to San Diego for graduate studies in biochemistry and started homebrewing regularly.

Chris' doctoral thesis focused on developing high cell-density growth techniques for an industrial yeast strain. Combining his research with his love of craft brewing, Chris developed a process to grow pitchable quantities of liquid brewers yeast. White Labs now provides high-quality, concentrated, liquid brewers yeast to breweries and homebrewers worldwide.

Given his expertise, Chris was a perfect choice to write "Round it Up," a how-to article on collecting yeast from beer bottles. This can be tricky, but Dr. White's tips make it easy. His story starts on page 28.

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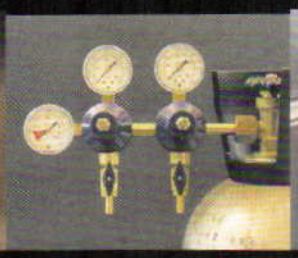

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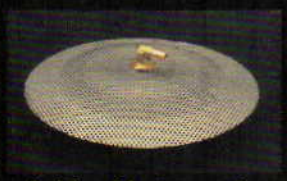

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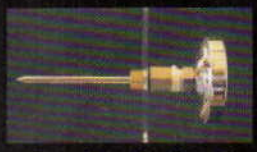

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How To Reach Us

Editorial and Advertising Office
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: (800) 900-7594
M-F 8:30-5:00 PST
E-mail: byo@pcspublink.com
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A De Koninck clone with minor tweaks inspires a reader letter.

Clone Success

I came back from Belgium about a month ago and my De Koninck clone *("Dubbel Vision," November 2000)* is smoking! I tweaked your recipe a bit to use the ingredients I had available. I went with 70 percent pilsner malt, 26 percent Munich (it was supposed to be Vienna, but I didn't have any), two percent Special B (instead of chocolate malt) and two percent wheat (the last four percent is my own twist on the ingredients). I used three additions of Saaz hops for a total of 24 IBUs, soft water, and White Labs WLP550 (Belgian Ale) yeast. I have had a professional brewer and several judges tell me it was very good and close to the real thing. It was one of the best beers I've ever made and I will continue to clone this one for a long time. I just thought you would like to know. Thanks for the great article.

Chris Baas
Midland Park, New Jersey

Formula Revised

Help me out! I haven't been to school in quite a few years. I can't seem to work the formula for converting Plato to specific gravity that I found on your Web site. I'm trying to convert 12 degrees Plato to specific gravity and it keeps coming out to SG = 1260.04539117, which is not even close to the 1.04838 number quoted. What am I doing wrong?

Erik Moe
via e-mail

You'll be happy to know that there is nothing wrong with your math skills and you don't need to go back to school. There was a mistake in the formula on our Web site. (It has since been fixed!) The correct formula is:
*{Plato/(258.6-([Plato/258.2]*227.1)}+1 = specific gravity*

Here's an example based on the numbers you mention above:

*{12/(258.6-([12/258.2]*227.1)}+1 = SG*

*{12/(258.6-(0.04648*227.1)}+1 = SG*

{12/(258.6-10.5546)}+1 = SG

{12/248.0454}+1 = SG

{0.04838}+1 = 1.04838 = SG

Keg to Kettle

I have two quick questions. The first one concerns a homebrew setup that was featured in your Summer 2001 issue. In reference to the picture you published in "Pot Shots" of Christian Thoreson and his brew kettles, I would think that brewing with gas burners in a small cabin would raise the fears of carbon monoxide poisoning. I was reading through "Brew Ware" *(Storey Communications, 1996)* and authors Karl Lutzen and Mark Stevens recommended all brewing be done in a garage with the doors open. Do you have any thoughts on this?

My second question is: I would like to transform a beer keg into a brewpot. I have talked to the distributor and he has no problems selling me one for the price of the deposit. How can I tell which ones are stainless and which are not? Thanks for listening and I really enjoy reading your magazine.

Thomas Pavlock
Kane, Pennsylvania

When operating a propane burner indoors, ventilation is certainly a serious concern. Brewing in a garage with the doors open is one safe way to brew inside. A carbon monoxide detector located in your brewing room would be another good investment.

The featured homebrewer in "Pot Shots," Christian Thoreson, replies: "I have double doors in the front of my brew room and windows on each side. I open the doors and the windows in the summer and turn on the fan under one window to force cross-ventilation. In the winter, I open both windows and turn on the fan for cross-ventilation. My brewery probably gets more air than a garage with the doors open. If it is a nice day, I just move everything outside to the deck."

Regarding your keg questions: We published a "Projects" article in our September 2000 issue called "From Keg to Brew Kettle." Check it out for step-by-step conversion instructions.

Most kegs today are made of stainless-steel. There might be a few aluminum kegs out there, but they should be easy to spot because they will have thousands of tiny pock marks on the

PHOTO BY THOM CANNELL

"From Keg to Brew Kettle" (September 2000) gives the lowdown on conversion.

exterior from corrosion. Stainless kegs, on the other hand, have a uniform, gray-silver appearance. Although they may be dented, a stainless keg should not have any pits on the exterior.

A more important issue involves the distributor's right to sell a beer keg. According to Bob Sulier of SABCO Industries: "Beer distributors do not own beer kegs. They simply assume custody and control over the kegs. Breweries own the kegs and the distributor has no legal right to sell a brewery's property. The deposit is only to encourage the return by the beer purchaser and is not even close to the real purchase price of a keg, which now can be as high as $80 new. Certainly, the owner (the brewery) should set the price, not the distributor.

Damaged or not, the distributor shouldn't be the one deciding if a keg can be salvaged. Brewery owners forward unusable kegs to repair vendors, like SABCO, for reconditioning. To get to the point, all homebrewers should be sure to buy their beer kegs from a legal reseller of kegs."

Homebrew Sabbatical

I'm lucky enough to work for a company that gives me a two-month paid sabbatical every seven years. Mine's coming up and I'm beginning to look into taking a brewing class for part of the time. I am already aware of the major brewing programs (such as the Siebel Institute in Chicago or the University of California at Davis), but most of those courses seem to be for people who want to get into the business and they last a semester. And they also seem to be on the expensive side.

Can you recommend some other brewing courses that are available in the U.S. or abroad for the homebrewer? I think a review of brewing courses and homebrew vacation packages would make an excellent and worthy topic for an article in *Brew Your Own*.

Nils Hedglin
Sacramento, California

For starters, contact all of the homebrew supply shops in your area to see if they have any courses (or would be willing to offer one-on-one instruction). Also, community colleges sometimes have elective courses in homebrewing. Another option: The American Brewers Guild in Woodland, California offers Internet-based correspondence courses in brewing. The high-level classes are intended for pro brewers, but a homebrew class is in the works for next year. Call the ABG at (800) 636-1331 or check out its Web site at www.abgbrew.com. ■

Write to Us!

Brew Your Own is always happy to receive feedback, both negative and positive. So send us your compliments and criticisms, insights and evaluations, or stories of homebrew failure and success. E-mail all correspondence to edit@byo.com ... or send regular mail to 5053 Main Street, Suite A, Manchester Center, VT 05255.

brewer profile

Humble Beginnings • David Reaser • Bethlehem, Pennsylvania

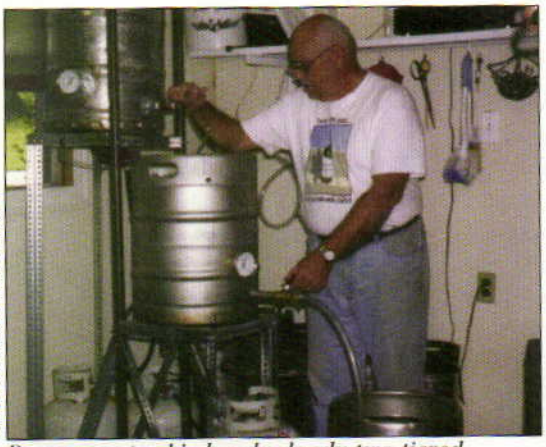


PHOTO COURTESY OF DAVID REASER

Dave operates his handy-dandy two-tiered brewing system in his garage/doghouse/brewery.

Our adventure began in April 2000. That was when my neighbor, Ray, and I began our homebrewing hobby in my driveway. I'm a cop and Ray had just retired from his job at a liquor store. We both live in Bethlehem, Pennsylvania (about 50 miles north of Philadelphia). We purchased our first beginners' kit and made an English brown ale. Of course, we thought our first batch of beer was awesome (our wives weren't quite as impressed) and this drove us deeper into the wonderful world of homebrewing.

One of our first challenges was naming our beloved ale. We sat in the driveway pondering the question and sipping our homebrew. Meanwhile, our wives were inside the house discussing how we looked like jackasses out there in the driveway. Thus, the name "Jackass Ale" came into existence.

We graduated to our first all-grain ale by July and almost cried when we had to use it to water the shrubs just three weeks later. This didn't stop us. Through reading, research and harrassing more experienced people, we finally got the process down and started to enjoy some consistent success. Our brewing process kept improving and we were making equipment all the time. (We were always working on a new and improved wort chiller.) By the time we got our system up and running to full capacity, the weather had turned cold and snowy. We weren't about to let weather stop us, though, so we moved our entire operation to Ray's enclosed patio. (Ray's wife loved us until we started regularly staining the rug with nasty boilovers.) We froze out there and often had to chip ice off of our equipment.

These hardships didn't dampen our enthusiasm and only led to a new level of commitment. We decided that we needed our own brew room. The best spot seemed to be the the "storage and dog" room in the back of my garage. (The dog didn't care.) By February we had started construction on the "Lewis Avenue Brewery." Our wives were convinced we didn't know what we were doing. My wife was especially alarmed when I had to shut off the water to hook up the sink and no one could take a shower for a whole day.

Despite the ongoing doubt of our loved ones, the brewroom is now complete and we are brewing some excellent beers. Since Ray is retired, he has become the head brewer. Our favorite beers are an oatmeal stout and a Czech lager. We even have a special lagering refrigerator.

We brew twice a month, strictly all-grain, in 10-gallon batches. We also mill our own 55-pound bags of grain. This provides us with plenty of homebrew to share with our friends — and our wives actually like it, too. This truly has been an adventure and it will continue to be for a long time!

reader recipe

Bannockburn Amber Ale

(5 gallons, all-grain)
OG = 1.065 FG = 1.016 IBUs = 40

I call this brew Bannockburn Amber Ale in honor of the battle in which King Robert the Bruce secured Scotland's independence. It's not a completely traditional Scotch ale but it's close enough.

Michael W. Martin
Canton, Texas

Ingredients

1 tsp. gypsum
7 lbs. two-row pale malt
1 lb. crystal malt (60° Lovibond)
3 oz. chocolate malt
1 lb. old-fashioned oatmeal
1 lb. golden brown sugar
9 AAU Northern Brewer hop pellets (1 oz. of 9% alpha acid)
1/2 tsp. Irish moss
Scottish Ale yeast (Brewer's Resource CL-200)
3/4 cup priming sugar

Step by Step

Add 1/2 tsp. gypsum to 12 quarts of water and heat to 130° F. Stir in crushed grains and oatmeal. Adjust temperature to 120° F and hold for 30 minutes. Raise temperature to 135° F and hold for 15 min. Raise temperature to 152° F and hold for 90 min. or until conversion is complete. Raise temperature to 175° F and hold for five min. Sparge grain with 5 gallons of water with 1/2 teaspoon gypsum added and heated to 160° F.

Bring to a boil and add brown sugar and hops and boil for 45 min. Add 1/2 tsp. Irish moss and boil for 15 more min. Remove from heat, cover and let sit for 20 min. Chill and strain wort into a carboy, add yeast starter and attach airlock. Ferment until complete. Prime and age for 4 to 6 weeks.

homebrew club

Club Cerveceros 1060 • Buenos Aires, Argentina

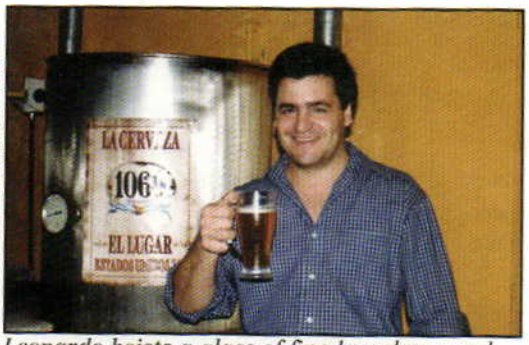


PHOTO COURTESY LEONARDO DE ALMEIDA

Leonardo hoists a glass of fine homebrew and celebrates the success of Club Cerveceros.

IN 1997, I WAS IN DALLAS, TEXAS, and it was there, for the first time, that I heard about beer being made at home. As soon as I learned this, I went to a shop to buy a kit. Back in Buenos Aires, I prepared my first batch and kept some of the yeast with the idea of making a new batch, but this time with an all-grain recipe. Homebrew ingredients and information about brewing was hard to come by in Argentina at that time.

After that first experience, I got together with a friend, Ulises Martinez, and worked on getting homebrewing ingredients and spreading the word about homebrewing in our country. Getting the ingredients was a real adventure. We already had a crop of yeast that I had saved. We obtained hops from a quality controller in a big brewery and, finally, we got some malt through the generosity of a person we knew who worked in the port of Buenos Aires. We would go at 5 in the morning to get it before his boss came.

Once we secured the ingredients, we began to brew beer with varying results. We got advice through the Internet because the brewpubs in our country, all four of them, wouldn't help us out.

To spread the information we had, we started a Web site to share our adventures with anyone who was interested. Nearly every day we would receive e-mails with questions and gradually we grew in number. In February of 2000 we had our first club meeting at a new brewpub that was opening. There were only six of us, including two professional brewers who were willing to give advice.

The group grew quickly. There were people who were new to this hobby and others who had been producing beer any way they could. We met every two weeks. Eventually, we had more than 80 homebrewers and had to divide into two levels, advanced and beginners.

We finally found companies to sell us ingredients in small quantities. We can only get pilsner malt and Cascade hops, but we have biologists in our group that help with yeast. The Club Cerveceros 1060 now has 200 members and a new brewpub is opening in Argentina each month. This lets us know that we are walking along the right path. Our Web address is www.cerveceros1060.com.ar. ■

—Leonardo de Almeida

reader tip

HERE'S A HELPFUL HINT TO REDUCE LAG TIME: Place ice in the bottom of your plastic fermenter, then pour your hot wort onto the ice. You can then adjust the water temperature by adding cold, hot or tepid water to make up the rest of the five gallons. With this method, the wort is cooled in less than two minutes. I've used this trick for years without any problems. I use a total of 1-1/2 gallons to 2 gallons of ice. Note: It's best if the water is pre-boiled before you freeze it. And don't try this in a glass carboy. It could crack.

Tom O'Connell
Ronkonkoma, New York

homebrew calendar

OCTOBER 6

All About Beer's 6th Annual World Beer Festival; Durham, North Carolina

Held at the Durham Athletic Park, this festival features 300 beers from 100 breweries around the world, homebrew demonstrations and live entertainment. For tickets and information call (800) 977-2337.

OCTOBER 13 AND 14

9th Annual Grand Old Portsmouth Fall Brewers Fest; Portsmouth, New Hampshire

This fall festival includes tastings from New Hampshire microbreweries and brewpubs, a New England Homebrewer of the Year contest and a homebrewing competition. For more information call (603) 422-7503.

OCTOBER 13

10th Annual Great Eastern Invitational; Adamstown, Pennsylvania

Taste 40 different styles of beer from 20 microbreweries and brewpubs in the Stoudt Brewing Company's beer garden and feast at the "Best of the Wurst" German buffet. Call (717) 484-4385.

OCTOBER 19 AND 20

18th Annual Dixie Cup Homebrew Competition; Houston, Texas

"La Copa Dixie" is sponsored by the Foam Rangers of Houston. Open to all homebrewers, ribbons will be awarded in 40 categories. Special category: "Beers that Burn Twice." For information, call (713) 956-8438.

Join the Homebrew Nation! Send your homebrewing stories, tips, recipes and events to edit@byo.com. If we publish your tale, we'll send you our cool new Euro-style BYO bumper sticker.

Pumpkin Beer

Brewing with the big orange fruit

by Thomas J. Miller

Brewer: John Tully of Lakefront Brewery in Milwaukee, Wisconsin. John completed a course at Siebel in 1996 and joined Lakefront in 1999 as head brewer.

Our malt bill makes the base beer for our pumpkin beer a cross between a pale ale and an amber lager. In other words, it's an amber-colored pale ale, but we ferment it as a lager.

The hops we use are Mount Hood and we target a very low bitterness profile, about 12 IBUs. We want just enough hops to counteract the sweetness from the malt, but we don't want to overwhelm the spices, which contribute to this beer's unique flavor.

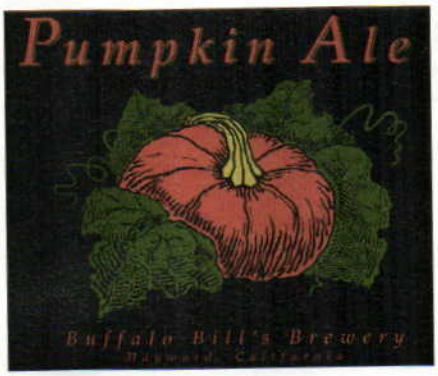
We use canned pumpkin in five-pound cans. They're easy to get. Homebrewers can find something similar in the grocery store, but probably in smaller cans. We use about 100 pounds of pumpkin in a 50-barrel batch. That's only about 0.064 pounds per gallon, so a five-gallon batch of homebrew would need roughly one-third of a pound of canned pumpkin. (With fresh pumpkin, you'd use more because it's not as concentrated.)

We add the pumpkin during the mash. We have experimented with this a lot over the years. For a while we thought we could pre-boil the pumpkin, to gelatinize it and make it more manageable in the mash tun, but it made no measurable difference. So now we just add it straight into the mash tun, and leave it in for the total length of the mash.

Pumpkin makes for a tough mash. It's necessary to constantly rake the top of your mash because the pumpkin forms a gelatinous layer that stops the sparge water from flowing through.

Once we're in the kettle, we add the hops, plus cinnamon, nutmeg and pumpkin pie spice. For a 50-barrel batch we add 3.5 pounds of cinnamon, one pound of nutmeg and five pounds of pumpkin pie spice. (For a five-gallon batch, for example, this equals a scant 1/5 ounce of cinnamon.) Obviously, the spices you add are very limited in quantity — a pinch of each.

After the boil we whirlpool and let it sit a bit longer than normal so most of the spices settle out. Then we transfer to the fermenter. Some of the spices will go with it but they settle out during fermentation. Then we pitch a German lager yeast from White Labs.



Brewer: Geoff Harries of Buffalo Bill's Brewery in Hayward, California. Geoff started homebrewing in 1981. He was the head brewer at Buffalo Bill's from 1987 to 1989, then eventually bought Buffalo Bill's in 1994, where he is now the owner and head brewer.

Our pumpkin beer is brewed at several locations for us, but one definite rule is that we always use fresh, whole pumpkins. The kind varies depending on the season and what is ripe, but we like to use Atlantic Giants and Big Macs. Both are jumbo in size and have lots of fiber. The fiber makes for easier mashing.

We roast the pumpkins, since a raw pumpkin really offers no flavor. Roasting converts some of the starch inside the pumpkin and lets us extract sugars and sweetness. We cook them as you would a squash, to the point where they're kind of done — maybe a little brown around the edges, just when they are starting to caramelize. But we don't want them turned to mush. Since pumpkins come in all different sizes, cooking times will vary. Once they are ready, we cut them open and pull out the seeds.

For six-and-a-half barrels, we use about thirty pounds of pumpkin, though this will depend greatly on the pumpkin. This is a bit more than three-quarters of a pound for a five-gallon batch, but once you start brewing you'll realize you don't want that much pumpkin anyway. Remember, this is a beer, not a vegetable beer. The pumpkin is meant to complement the malts, not take them over. The base beer is generally a red ale or amber beer. You want the color in the beer to come from the malt, not from the pumpkin.

We do a standard sparge. If you overcook the pumpkin it causes a stuck mash, so don't over-roast.

The hops should be low-key and subtle, just enough bitterness to balance the malt sweetness. The dominant character will be the upfront malt flavor, followed by a finish that highlights the cinnamon, nutmeg and clove. We put whole spice in a sparge bag and then hang them in the conditioning tanks after the boil. This is the way to get that nice, spiced character because it's kind of like dry-hopping.

Brewer: Brett Vanderkamp of New Holland Brewing Company in Holland, Michigan. Brett took the Siebel brewing course and opened New Holland in 1997.

The first thing to remember with pumpkin beer is that it's going to be a long brew day. The way pumpkin is used in the brew plays a big role in what kind of troubles you'll have making it, and the ultimate flavors you will get, but it is a difficult brew. If you put the pumpkin in the kettle and boil it, you will get some pumpkin flavor and body, but you won't get as much as if you had put it in the mash.

In the mash, you'll get all the by-products of the pumpkin you're looking for — flavor, body and some fermentable sugars. We put our pumpkin in the mash tun but this method comes with a cost. Pumpkin is sticky as hell in the mash and a pain to run off. Count on needing two to three times as much time to run off the wort to the kettle.

We use rice hulls in the mash and this helps a little, though the mash still gets gummed up. The rice hulls provide more husk material to make the bed more porous, but they don't add flavor to the mash.

Initially we used fresh pumpkin in our beer, but after some initial experimentation we found we got much better results from canned pumpkin — and it requires much less labor! When you're brewing large batches, cutting up fresh pumpkins is too much extra work. Homebrewers could probably go for it, though.

Pumpkin makes up about twenty-five percent of the total grain bill. I'd suggest that for homebrewers it's better to start off doing pumpkin beers with less pumpkin than more. This way they can get used to what they are doing and the impact that pumpkin has on the beer.

We use Mount Hood hops, which is a Hallertau seedling. We hop lightly, just under 20 IBUs. There are two strikes, one at 30 minutes and one at 75 minutes. The latter hop addition provides just a touch of flavor and aroma, but not too much.

More important are the spices. We use ginger, cinnamon, nutmeg and cloves. I recommend spicing with 30 minutes or less left in the boil. Add spices before this and you'll boil away flavor and, most importantly, aroma. Then we pitch with American ale yeast and ferment at standard ale temperatures (around 70° F). ■

Clean Glasses

Using honey, near beer and mediocre yields

Mr. Wizard

Can you explain the do's and don'ts of cleaning my beer glasses?

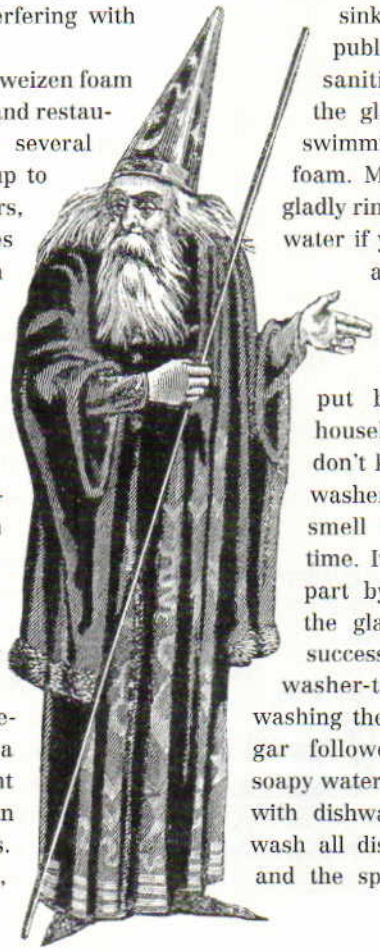
Chris Patterson
Downers Grove, Illinois

With beer glasses, the don'ts are much more critical than the do's. The biggest no-no is leaving any type of soap or fat on the glass surface. These compounds will ruin beer foam before it ever has a chance. Just the other night I had a delicious hefeweizen served in a traditional half-liter weizen glass. The beer had a thin, pathetic crown of foam sitting sadly on top of the beer. I swirled it in hopes of creating some more foam and had no success. The problem was the glass — some compound was interfering with my beer foam!

What happened to my weizen foam is all too common in bars and restaurants. My guess is that several unfortunate events lead up to the problem. For starters, cleaning beer glasses begins with clean wash water. If you wash your beer glasses at the same time that you wash other dishes, be sure to wash your beer glasses first. Some brewers use special detergents for beer glasses. I think ordinary dish soap is the best thing to use. The next item you need to properly clean your glasses is a clean sponge or dishcloth. These items are too frequently overlooked and a grimy cleaning implement can add oils to your clean dishwater and beer glass. When cleaning the glass, pay special attention to the rim since this is where food fats and lipstick accumulate. Finally, thoroughly rinse the glass with warm water and allow the glass to air dry.

The problems that happen in a busy bar can just as easily happen at home if you are not careful. Clean dishwater is a big deal. In an ideal world, beer glasses are never washed in the same area as glasses or dishes containing fat. In a bar, many drinks contain fat from milk or cream and bartenders are too busy to look out for the glass that contained a cream drink for special handling. Usually the greasy culprit comes back to the bar and is plunged in the glass sink where it releases its oily soil.

Another bar problem is the use of sanitizers. Most bars are required to use sanitizers in their glass sinks. While this is good public health policy, the sanitizer either causes the glass to smell like a swimming pool or ruins the foam. Most bartenders will gladly rinse beer glasses with water if you ask them nicely and explain the reason for your odd request. Whatever you do, try to never put beer glasses in a household dishwasher. I don't know why, but dishwashers cause glasses to smell really funky over time. It may be caused in part by mineral scale on the glass surface. I have successfully rescued dishwasher-tainted glasses by washing them with white vinegar followed by hot, clean, soapy water. The other problem with dishwashers is that they wash all dishes simultaneously and the spaghetti sauce from last Monday's dinner ends up on your favorite beer glass. It just doesn't seem like the right way to treat such an important item!



Mr. Wizard

I'm trying to find a conversion formula for how many cups of honey are needed to replace one cup of corn sugar. Can you help me?

Lance Leinenbach
Jasper, Indiana

Honey contains about 25 percent water and 75 percent solids and corn sugar contains about 98 percent corn sugar and 2 percent water. I like to convert ingredient figures into the easiest-to-use number for ease of calculation. In this case, 1 cup of honey contains about 0.75 cup of dry solids, mainly sugars, and 1 cup of corn sugar contains 0.98 cup of dry solids. This means you need to use 1.31 cups (0.98/0.75) of honey to equal 1 cup of corn sugar.

The dry solids basis is handy for evaluating raw brewing materials because dry solids increase the specific gravity of water when they are dissolved. Suppose you had some unusual sugary liquid and wanted to use it as an ingredient and had the same question. You would read the nutritional label and find out how many grams of carbohydrate are contained in the serving size. Suppose there are 17 grams of carbohydrate per 28-gram serving. This equates to 61 percent carbohydrate. Assuming there is not much protein, this number represents the amount of solids in the ingredient. This mystery ingredient would require 1.61 cups to equal 1 cup of corn sugar.

Mr. Wizard

What's the best way to remove alcohol from beer? A beer-loving friend

"Help Me, Mr. Wizard"

was forced to quit drinking because of diabetes. Commercial NA beers aren't great and he asked me to try to make a good beer with no alcohol. Could you tell me the temperature at which alcohol becomes unstable and turns to vapor? What should I do to retain the hop aroma? Should I freeze the beer and drain off the alcohol?

Cory Brown
via e-mail

I have been asked this question numerous times over the years but have very rarely responded because I don't have a very good answer. This question is timely in lieu of a recent article published in *Consumer's Report* (*"Which Brew for You," August 2001*). Consumers Union, the group that publishes *Consumer's Report*, utilized two well-respected, un-biased consultants to evaluate commercially brewed beers. Although the number of beers evaluated was small, they were able to evaluate the leading brands in the various beer categories included in the study. One of the categories was non-alcoholic beer.

The report really did not have much positive to say about the non-alcoholic beer category. As a group, the beers were unbalanced and lacked flavors consistent with their alcohol-containing counterparts. Why is this the case? We as homebrewers can be arrogant and blame it on the poor brewing skills of the large breweries who produce non-alcoholic beers. But this opinion is more hot air than substance. The brewers who produce non-alcoholic beer are arguably the most knowledgeable and resourceful brewers in the world and probably are doing just about as good as any brewer can to produce a non-alcoholic version of their regular beers.

To make a non-alcoholic beer, brewers have two primary methods from which to choose. The first is to remove alcohol from beer. The most obvious way to do this is through distillation. Unfortunately, many of the compounds contributing to beer's flavor profile — esters, hop oils and sulfur — are volatile and are removed during distillation along with the alcohol. In addition to removing aromatic compounds, distillation also heats the beer and can accelerate oxidation if oxygen is present, which it usually is. Distillation can be conducted at lower temperatures if conducted in a vacuum where the boiling point of liquids is decreased. Some brewers use a special cross-flow membrane filter to remove alcohol. Both of these methods are way out of reach for most homebrewers because of equipment costs.

The second option is to never produce alcohol and to not worry about removing it. I have heard that Coors produces their "Cutter" using this strategy. The idea is to add a lot of yeast to a low-gravity wort and hold the mixture very cold to prevent fermentation. The yeast adds some beer flavor, perhaps by osmosis or autolysis, and then the beverage is filtered and pasteurized. This may or may not all

be accurate and I have no way to confirm it since Coors is not in the business of giving away proprietary information. The explanation makes enough sense to me. Again, most homebrewers are not equipped to try this method.

The fact is that beer is an alcoholic beverage and many of the flavor components are a direct result of fermentation. Ethanol, other alcohols and volatile esters and acids contribute to beer's mouthfeel and aroma — and when these compounds are removed so are their sensory properties.

I really like to eat cheese and probably would eat a pound a day if it didn't turn me into a whale and clog my arteries. I despise fat-free cheeses because they are not the same thing, so I don't buy fat-free cheese. I also realize that homemade fat-free cheese would probably be much worse than the commercial products! My negative view on this topic is why I avoid questions about non-alcoholic homebrew.

Mr. Wizard

This magazine has published at least two formulae that one can use to calculate extract efficiency. One of the variables in the calculation is, of course, the amount of malt used. Here's my question: When the formula says "amount of malt mashed," is it referring to base malt only, or to the total of base malt plus specialty malts? Also, my yields have been somewhat mediocre, typically 25 points per pound (assuming I count base and specialty malt), although I have had some yields as low as 20 points per pound. I'm able to hold my mash temperature to within 2 to 4 degrees of target temperature during the mash. I've got good control over the temperature of my sparge water (I'm able to keep that at 170° F). Typical sparge time for a five-gallon batch is 45 minutes to an hour. I'm suspecting that the most likely cause of the low yields I'm getting is that my grain isn't sufficiently crushed. If my problem does lie with grain, what does properly crushed grain look like? How likely is it that higher-than-optimal mash pH is the culprit? Is there anything else that could be causing my

yield problem? Thanks for any advice or help you can offer.

Barry Shantz
Cincinnati, Ohio

Extract yield is simply defined as the weight of solids extracted into wort during mashing compared to the weight of ingredients added to the mash (or kettle if doing a partial mash with a grain bag). All ingredients added to the mash will contribute to wort specific gravity and are included in the calculation. Extract yield is affected by many variables, including the mashing type, malt quality, equipment design and technique.

When conducting a mash it is key to get the big items in line. Mash temperature, pH and mash thickness are the variables that most concern me. For an infusion mash, I want my mash temperature between 149° and 158° F, the pH to be between 5.2 and 5.6 and the mash thickness to be between 2.5 and 3.5 liters of water per kilogram malt (0.3 to 0.5 gal. per lb.). As long as these parameters are OK there should be no big problems in the mash. When sparging begins, as long as the sparge water is between 160° and 170° F and wort collection takes at least 30 minutes, I am not worried.

Malt milling is the most common and likely cause of low yield. The appearance of properly crushed malt changes depending on the type of wort separation system being used. For example, if you have a false bottom or copper manifold system with wide slots, you will have to use coarser grist. But you should never find whole malt kernels after milling. Whole malt kernels will not yield any extract.

I use a lauter tun for wort separation and it has a false bottom with one-millimeter slots. My grist mainly consists of broken pieces of endosperm (the white stuff inside the malt kernel) that look like little pebbles and large pieces of malt husk. The grist also has some finer particles of endosperm, some flour and some bashed-up pieces of husk. If I mill finer, I will get more of the small particles and the result is cloudy wort. If my lauter tun had 0.7-millimeter slots instead of 1-mm slots I could mill finer and still produce very clear wort. I get about 35 points per pound in my system, and I attribute this to proper milling and a nice false bottom on my lauter tun. If you try milling finer and the husk is getting really beaten up you may want to try a different mill. If the husk looks good but you are having clarity problems, your slot width may be too wide. ■

Do you have a question for the Wizard? Write to him care of Brew Your Own, 5053 Main Street, Manchester Center, Vermont 05255 or e-mail your question to wiz@byo.com. Please include full name and hometown. Sorry, but the Wizard can't answer questions personally.

Beers Cloned

Winter Brew and Old Leghumper

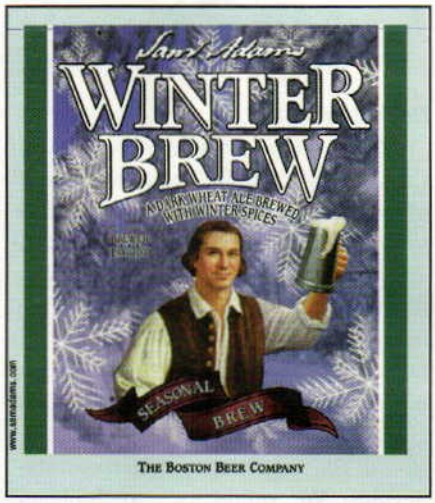
by Steve Bader

Dear Replicator,

I am a big fan of the seasonal Samuel Adams Winter Brew, a dark lager beer, and I would love to know how to make it myself at home! Can you find a recipe for me?

Todd Essex
Alexandria, Virginia

Winter seasonal beers can be a challenge. To get started, I talked to Jim Pericles of the Boston Beer Company about this beer. Winter Lager is a dark lager-style beer that contains some wheat malt. This style is noted for its strong to intense malt character. Bitterness is at 26 to 30 IBUs. Jim mentioned that they use a "subtle" amount of spices to give it a nice holiday spirit. They use Curacáo orange peel, fresh ginger root and cinnamon (Saigon variety) to give the beer a hint of these flavors. For yeast, Sam Adams uses a "private" strain, but Jim suggests a lager yeast with a malty profile. This beer is given an extended aging period (about one month), so brew today for December drinking! For more information check out their Web site at www.samadams.com.



Sam Adams Winter Brew

(5 gallon, extract with grains)
OG = 1.069 FG = 1.016 IBUs = 26 to 30

Ingredients

6.6 lbs. Briess wheat malt extract syrup
1.5 lbs. crystal malt (60° Lovibond)
1 lb. wheat malt
1.5 lbs. Munich malt (20° Lovibond)
1 teaspoon Irish moss
1 oz. Curacáo orange peel (bitter orange peel)
0.5 oz. ginger root (freshly grated)
0.5 tsp. cinnamon (powdered)
9.5 AAU East Kent Goldings (2 oz. of 4.75% alpha acid)
4.5 AAU Tettnanger (1 oz. of 4.5% alpha acid)
4.7 AAU Hallertau Hersbrucker (1 oz. of 4.7% alpha acid)
3/4 cup corn sugar to prime
German Lager yeast (White Labs WLP830) or Bavarian Lager yeast (Wyeast 2206)

Step by Step

Steep the grains in 2.5 gallons of water at 150° F for 30 minutes. Strain out the grains, add the wheat malt syrup and return to a boil. When the wort begins boiling, add East Kent Golding hops, Irish moss, and boil for 60 minutes. Add spices for the last 15 minutes of the boil.

Add Tettnanger and Hallertau hops for the last 2 minutes of the boil. Remove from heat and cool wort in ice bath or with wort chiller. Transfer to fermentation vessel (glass carboy). Add enough cold water to the wort to bring the volume up to 5.5 gallons. Pitch yeast and ferment at 50° to 55° F for 3 to 4 weeks. Prime, then bottle or keg. You should lager this beer for about 4 weeks prior to serving.

All-Grain Option: Replace the wheat malt syrup with 3.5 pounds of pale malt. Increase the Munich malt to 4 pounds and the wheat malt to 4 pounds. Also change the boiling hops to a smaller quantity, 7 AAU (1.5 oz of 4.75% alpha acid). I would suggest a two-step mash schedule for this beer. This involves doing a 30-minute protein rest at 122° F, followed by 60 minutes at 155° F.

Note that the quantity of boiling hops are slightly lower for the all-grain batch. This is due to the greater hop extract efficiency that results from a full boil of the entire wort volume. The remainder of the hop, spice additions and fermenting instructions are the same as the above extract-with-grains recipe instructions.

Dear Replicator,

Every year, we make our way to Canton, Ohio for the Pro Football Hall of Fame inductions and game. We love to search out and sample the local craft brews while we're there. One favorite place is The Thirsty Dog. They have this amazing porter called Old Leghumper. It's a robust, dark brown porter that is very refreshing. This past year, they even had a raspberry version of Old Leghumper that was unbelievable. We would love to duplicate these at home.

Al Potter
Kirkwood, New York

Old Leghumper is a beer born of passion. I spoke at length with Fred Karm, head brewer at Thirsty Dog, and he truly loves brewing! Fred is very passionate about his beer. In fact, he doesn't get enough brewing at Thirsty Dog, so he gathers some friends and homebrews about once a month. Fred was generous enough to give us lots of tips for brewing his Old Leghumper.

Old Leghumper is a robust porter, creamy and full-bodied with a malty sweet taste. It has a high starting gravity of 1.067 and a high finishing gravity of 1.024. The high finishing gravity is achieved by a large amount of non-fermentable sugars, derived from dextrin malt (or malto-dextrin powder) and crystal malts in the grain bill.

This beer is unusual because more than half of the grain bill is comprised of specialty malts. Hop bitterness is on the low end of the scale for this style, coming in at 26 IBUs. Thirsty Dog uses London Ale yeast (Wyeast 1028), and pitches a large starter volume, then ferments at a high 72° F. Finally, Fred uses isinglass finings after the beer is fermented to give this beer a nice level of clarity.

To make the raspberry version, add 6 ounces of natural raspberry flavoring (or the juice from 4 pounds of fresh raspberries) at the end of the boil. Let sit for 10 minutes to sanitize juice. You can add more or less to suit your personal taste. For more information about Thirsty Dog beers, check out www.thirstydog.com. ■

Thirsty Dog Old Leghumper Porter

(5 gallons, extract with grains)
OG = 1.067 FG = 1.024 IBUs = 24

Ingredients

6.6 lbs. John Bull plain light malt extract syrup
1 lb. malto-dextrin
10 oz. crystal malt (20° Lovibond)
10 oz. crystal malt (80° Lovibond)
10 oz. crystal malt (120° Lovibond)
1 lb. chocolate malt
1.5 lbs. Munich malt (20° Lovibond)
12 oz. flaked barley
8 AAU German Northern Brewer hops (1 oz. of 8% alpha acid)
5 AAU Liberty hops (1.5 oz. at 3.7% alpha acid)
London Ale (Wyeast 1028) or Burton Ale (White Labs WLP023) or (seasonal) London Ale (WLP013)
1/2 teaspoon isinglass for fining
3/4 cup corn sugar for priming

Step by Step

Steep the 6 grains in 3 gallons of water at 150° F for 30 minutes. Strain out the grains, and add the malto-dextrin and malt syrup and return to a boil. When the wort begins boiling, add Northern Brewer hops and boil for 60 minutes. Add the Liberty hops for the last 5 minutes of the boil.

Cool wort in an ice bath or with wort chiller. Transfer to primary fermenter and add enough cold water to bring the volume up to 5.5 gallons. Pitch yeast and oxygenate-aerate well. Ferment this beer on the warm side, at 72° F as per the brewer's instructions, for 7 to 10 days. Add the isinglass to the beer after fermentation is complete to help achieve clarity. Prime, bottle and age for about two weeks.

All-Grain Option: Replace the malt syrup and malto-dextrin with 6.5 lbs. of pale malt and 1.25 lbs. of dextrin malt. Mash the grains together. Fred says Thirsty Dog uses a simple single-infusion mash at 155° F for this beer. I would suggest 60 minutes. Change the boiling hops to 6 AAU German Northern Brewer hops (0.75 ounce at 8% alpha acid). Note that the boiling hops are slightly lower for the all-grain batch, due to greater hop extract efficiency from a full boil of the entire wort. Ferment and condition as described in the extract-with-grains instructions.

Pilsner and Ale

A European pale lager and a celebration ale

by Tess and Mark Szamatulski

When we wake up one October morning and see the first frost on our once-green plants, we know winter is coming. That means lagering time is upon us, as well as the upcoming holidays. This month we have chosen a classic European lager and a celebration ale for those festive times ahead.

European Pale Lager (Bohemian Pilsner)

OG = 1.044 to 1.056 FG = 1.013 to 1.017 IBUs = 35 to 45 SRM = 3 to 5 ABV = 4 to 5.3%

Bohemian pilsner is a complex, well-rounded brew. It was first brewed in 1842 in the city of Plzen — called "Pilsen" in Germany — in the Czech Republic. This city is near Zatec, where the noble Saaz hops are grown. The city's water is soft and the city is surrounded by fields of premier two-row Moravian barley. In 1842 a Bavarian monk brought a lager yeast to Josef Groll, an immigrant brewer, who fermented his beer at cold temperatures. The combination of fragrant noble hops, soft water, the best barley and a cold-fermented lager yeast gave birth to the first blonde lager, the mother of today's lagers.

Commercial Beers To Try

The classic and first Bohemian pilsner to be brewed was Pilsner Urquell, the beer from which all other beers of this style descend. In German, Urquell means "original source." Other classic examples of this style are, of course, Budweiser Budvar, Gambrinus Pilsner and Staropramen. American examples of this style are Dock Street Bohemian Pilsner, Pete's Wicked Bohemian Pilsner and Full Sail Brewing Company's Full Sail Pilsner.

Bohemian pilsner is a medium-bodied, light-gold to deep copper-gold beer with medium carbonation. The head is dense, creamy and long-lasting. The aroma is rich with complex malt and an impressive hop bouquet of floral, spicy Czech Saaz hops. A complex maltiness marries well with the sweet floral flavor and rounded bitterness from the hops. It finishes with a perfect balance between floral hops and malt. It is very clean tasting and delicate with no fruitiness or esters.

Hops, Malt and Yeast

The classic Bohemian pilsner should have Czech Saaz additions for bitterness, flavor and aroma and it can also be dry-hopped. German Hallertau Hersbrucker hops can be substituted for the bittering hops if desired. German two-row pale malt should be used (80 to 85 percent of the grain bill). The specialty malts should be German light crystal malt, German Munich and a small amount (1 to 2 ounces) of aromatic malt. For yeast, try Czech Pilsner Lager (Wyeast 2278) or Bohemian Lager (Wyeast 2124). White Labs Pilsner Lager (WLP800) can also be used successfully.

Bohemian Pilsner

(5 gallons, extract with grains)
OG = 1.054 to 1.055 FG = 1.013 to 1.014 SRM = 4 IBU = 40 ABV = 5.3%

Ingredients

4 oz. German crystal malt (2.5° Lovibond)
4 oz. German Munich malt
6.25 lbs. Muntons extra-light dried malt extract (DME)
10.5 AAUs Czech Saaz (3 oz. of 3.5% alpha acid) (bittering)
3.5 AAUs Saaz (1 oz. of 3.5% alpha acid) (flavor)
1 tsp. Irish moss
3.5 AAUs Czech Saaz (1 oz. of 3.5% alpha acid) (aroma)
1.75 AAUs Czech Saaz (0.50 oz. of 3.5% alpha acid) (dry hop)
Czech Pils (Wyeast 2278) or Pilsner Lager yeast (White Labs WLP800)
1-1/4 cups Muntons extra-light dried malt extract (DME) for priming

Step by Step

Bring 1/2 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 1/2 gallon of 168° F water. Add the dry malt extract and bittering hops. Bring the total volume in the brewpot to 2.5 gallons. Boil for 45 minutes, then add the flavor hops and Irish moss. Boil for 12 minutes, then add the aroma hops. Boil for 3 minutes, then remove the pot from the stove. Cool wort for 15 minutes in an ice bath or chill with wort chiller. Strain into the primary fermenter and add water to obtain 5-1/8 gallons.

Add yeast when wort has cooled to below 80° F. Oxygenate-aerate well. Start fermentation at 60° to 62° F until fermentation begins (24 hours). Bring primary fermenter to 47° to 52° F for 7 days then rack into secondary (glass carboy) and add dry hops. Ferment at 47° to 52° F until target gravity has been reached and the beer has cleared. (4 weeks). Prime and bottle. Carbonate at 70° to 72° F. for 2 to 3 weeks. Store at cellar temperature.

Partial-Mash Option: Acidify the mash water to below 7 pH. Mash 2.75 lbs. German two-row pilsner malt and the specialty grains in 1 gallon of water at 122° F for 30 minutes and then at 151° F for 90 minutes. Sparge with 1.5 gallons of water at 5.7 pH and 168° F. Then follow the extract recipe, omitting 2 lbs. of Muntons extra-light dried malt extract from the boil.

All-Grain Option: Acidify the mash water to below 7 pH. Mash 10 lbs. German two-row pilsner malt and the specialty grains in 3.5 gallons of water at 122° F for 20 minutes and then at

151° F for 90 minutes. Sparge with 4.75 gallons of water at 5.7 pH and 168° F. Total boil time is 60 minutes. Add 8.2 AAUs of bittering hops for the entire boil. Add flavor hops, Irish moss, aroma hops and dry hops as indicated by the extract recipe.

Helpful Hints: If your water is soft (below 50 ppm hardness), it is proper for the style. If your water is moderate (between 50 to 200 ppm hardness), dilute it 50:50 with distilled water. If your water is hard (greater than 200 ppm hardness), use bottled water. Begin lagering at 45° F and slowly decrease the temperature to 34° F over a period of 2 weeks. This Bohemian pilsner will peak between 1 and 3 months after it is carbonated and will last at cellar temperatures for 5 months.

Celebration Ale

OG, FG, IBUs, SRM and ABV all vary with base beer style.

Celebration beers have been brewed throughout history for special events such as anniversaries, weddings and holidays. They have long been a tradition in Europe and many U.S. microbreweries are now brewing holiday ales. It has been said that the Anchor Brewing Company in San Francisco began the celebration ale trend in America with their famous "Our Special Holiday Ale." Many breweries all over the world, in fact, brew celebration ales for the holidays.

Usually celebration ales are bigger, and sometimes hoppier, versions of one of their regular beers, such as a pale ale or a bitter. Spices might be added, especially around the holidays, as is the case with "Our Special Holiday Ale."

The celebration ale we are brewing this year is English in origin. It is based on an English pale ale but it is very big for the style, above the guidelines and darker in color. This beer pours with a heady aroma, a blend of sweet, aromatic malt and spicy, floral hops. This delicious port-wine-colored beer has a thick, beige head that lingers long in the glass. It is vinous and full-bodied, with warming alcohol making itself slowly evident. It finishes long and well-balanced.

Commercial Beers To Try

There are many celebration beers to try. Some fine examples are: Sierra Nevada's Celebration Ale, Anchor Steam's Our Special Holiday Ale, Redhook's Winterhook Winter Ale, Shipyard's Longfellow Winter Ale, Samichlaus Bier, Bush de Noel, Moctezuma Noche Buena, Stille Nacht by De Dolle Brewers and Ballard's Wassail Special Strong Ale.

Hops and Malt, Yeast, Sugars and Spices

The hops will vary with the base style. If brewing an English-style ale, use the hops that the U.K. brewers use in their beers. For an American-style ale, use American hops. Just remember to increase the amount of hops along with the malt. As with the hops, use a malt that is appropriate for the style of base beer.

Sugars can be used to increase the alcohol and to give a slightly different nuance to the brew. Try Lyle's Golden Syrup, treacle, molasses (not blackstrap, which is too strong a flavor) or Belgian candi sugar. Some popular spices to be used, in moderation, are nutmeg, cinnamon, ginger, cloves, allspice, juniper berries, spruce tips, sweet gale, grains of paradise, bitter or sweet orange peel and vanilla bean.

Any yeast appropriate for the style is fine. If you are brewing a very high-gravity beer, make sure that the yeast will ferment at alcohol levels that match the gravity you want. If not, you will end up with a very sweet brew.

Celebration Beer

(5 gallons, extract with grains)
OG = 1.069 FG = 1.019 to 1.020
SRM = 22 IBU = 35 ABV 6.3%

Ingredients

1 lb. British crystal malt
8 oz. torrified wheat
1 oz. British black patent malt
7.5 lbs. Muntons extra-light DME
8 oz. malto-dextrin
9.2 AAUs Fuggles
(2 oz. of 4.6% alpha acid) (bittering)
5 AAUs East Kent Goldings
(1 oz. of 5% alpha acid) (flavor)
1 tsp. Irish moss
2.5 AAUs East Kent Goldings
(0.50 oz. of 5% alpha acid) (aroma)
2.5 AAUs Styrian Goldings
(0.50 oz. of 5% alpha acid) (aroma)
Special London (Wyeast 1968) or
English Ale (White Labs WLP002)
1-1/4 cup Muntons extra-light dried malt extract (DME) for priming

Step by Step

Bring 1 gallon of water to 160° F, add crushed grain and hold for 30 minutes at 150° F. Strain the grain into the brewpot and sparge with one gallon of 168° F water. Add the dried malt extract, malto-dextrin and bittering hops. Bring the total volume in the brewpot to 2.5 gallons. Boil for 45 minutes, then add the flavor hops and Irish moss. Boil for 14 minutes, then add the

aroma hops. Boil for 1 minute, then remove the pot from the stove. Cool wort for 15 minutes in an ice bath or chill with wort chiller. Strain into the primary fermenter and add water to obtain 5-1/8 gallons. Add yeast when wort has cooled to below 80° F.

Ferment at 70° to 72° F for 7 days then rack into secondary. Ferment until target gravity has been reached and beer has cleared (3 weeks). Prime and bottle. Carbonate at 70° to 72° F for 3 to 4 weeks. Store at cellar temperature.

Partial-mash option: Acidify the mash water to below 7 pH. Mash 1.5 lbs. British two-row pale malt and the specialty grains in 1 gallon of water at 154° F for 60 minutes. Sparge with 1.5 gallons of water at 5.7 pH and 168° F. Then follow the extract recipe, omitting 1.75 lbs. of Muntons extra-light DME from the boil.

All-grain option: Acidify the mash water to below 7 pH. Mash 11.5 lbs. British two-row pale malt and the specialty grains in 4.25 gallons of water at 154° F for 90 minutes. Sparge with 5 gallons of water at 5.7 pH and 168 F. The total boil time is approximately 90 minutes. Add 6.4 AAUs of bittering hops for the last 60 minutes of the boil. Add the flavor hops, Irish moss and aroma hops as indicated by the extract recipe above.

Helpful Hints: If your water is soft (below 50 ppm hardness), add 1/4 tsp. non-iodized table salt, 1-1/2 tsp. calcium carbonate (chalk) and 1/4 tsp. Epsom salts. If your water is moderate (between 50 to 200 ppm hardness), add 1/4 tsp. non-iodized table salt and 1/2 tsp. calcium carbonate. If your water is hard (greater than 300 ppm hardness), add 1/4 tsp. non-iodized table salt. This ale is ready to drink 2 months after it is carbonated. It will peak between 2 and 6 months and will last for up to 9 months at cellar temperatures. ■

Tess and Mark Szamatulski are the owners of Maltose Express in Monroe, Connecticut. All recipes have been adapted from their book "Beer Captured" (Maltose Press, 2000).

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BREWFERM beerkits are the first and only real Belgian beerkits available. Thanks to BREWFERM every homebrewer can easily brew his own Belgian-style beer. BREWFERM beerkits are always made from **100% pure malt extract** and are being produced in small special batches, according to **original Belgian recipes**. We only use the finest malts and the best hops available, guaranteeing a constant and high grade quality. Furthermore, to Belgian tradition, other **special ingredients**, such as flakes, herbs or even fruit juices are added to achieve the special aromas and tastes of Belgian beers.

RECIPE

- Brew your BREWFERM No-Boil beerkit (approx. 1 hour)
- Leave it to ferment for 1 week to 10 days
- Bottle/keg the beer and leave it to referment and ripen for 6-8 weeks
- Enjoy the results! (can take more than 1 hour)

BREWFERM, the beerkit that doesn't need to be hassled around with to get superb results!

Pre-hopped Kit Styles AVAILABLE

ABBEY BEER

AMBIORIX

CHRISTMAS

DIABOLO

FRAMBOISE

GALLIA

GOLD

GRAND CRU

KRIEK

OLD FLEMISH BROWN

PILSNER

TRIPLE

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RECIPE

Northern German Wheat
(Coopers Wheat Beer II)
OG = 1.036 FG = 1.012
IBUs = 17 ABV = 2.7%

1. Mix 0.5 lbs. corn sugar and 1.5 lbs. wheat or pale dry malt extract in at least 2 liters of water. 2. Heat to 160 to 180° F (48 to 58° C). Hold for 15 minutes. 3. Remove from heat and mix in one can **Coopers Brewmaster Series Wheat Beer Kit**. 4. Cool wort in pot to room temperature. Transfer into fermenter. Aerate well, then top up to five gallons if necessary. 5. Pitch one package **Coopers Wheat Beer Yeast** when temp is less than 80° F. 6. Ferment at 68 to 74° F.

Pre-hopped Kit Styles AVAILABLE

THE BREWMASTER SERIES
PILSENER
INDIA PALE ALE
WHEAT BEER
NUT BROWN ALE

THE BREWERY SERIES
LAGER
DRAUGHT
REAL ALE
CANADIAN BLONDE
CLASSIC DARK
STOUT
BITTER

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RECIPE

Put the cans from the beer kit into hot water to soften the contents. Boil about 7 US pints of water, sterilize your fermenter and stirrer and add the boiling water and can contents. Stir well then add cold water up to the 6 US gallons mark then add the yeast supplied. Leave to ferment then bottle and finally drink - sounds too easy doesn't it?

MUNTONS offer you their top quality beer making kits. Take home and savour the taste of your choice - then come back and try another kit - perhaps one that is new to you. Beer making with MUNTONS is so easy. You and your friends will discover rich flavours that can only come from a manufacturer who selects the finest barley, malts with care and then also controls the malt extract and beer kit making process. You are just a few short steps away from enjoying the many years of MUNTONS experience for yourself!

Pre-hopped Kit Styles AVAILABLE

PREMIUM GOLD RANGE
SMUGGLER'S SPECIAL PREMIUM ALE
OLD CONKERWOOD BLACK ALE
MIDAS TOUCH GOLDEN ALE

GOLD RANGE
OLD ENGLISH ALE
CONTINENTAL PILSNER
HIGHLAND HEAVY SCOTTISH ALE
DOCKLANDS PORTER
IMPERIAL STOUT
INDIA PALE ALE

CONNOISSEURS RANGE
EXPORT STOUT
NUT BROWN ALE
BOCK
TRADITIONAL BITTER
YORKSHIRE BITTER
IPA BITTER
CONTINENTAL LAGER
PILSNER
EXPORT PILSNER
WHEAT BEER

PREMIUM RANGE
BITTER
IRISH STYLE STOUT
SCOTTISH HEAVY ALE
PILSNER
AMERICAN STYLE LIGHT
BARLEY WINE
CANADIAN BEER
MIDLAND MILD
OLD ALE
LAGER

"I wouldn't have believed that a kit beer could be so good"

Roy Kelly - Kent Correspondent CAMRA's 'What's Brewing' magazine (April 2000)

In Roy Bailey's local Good Beer Guide Pub, the customers' reaction was *"uniformly complimentary"* and *"most of them thought it was a full-mash ale"*

"I'm really impressed! This is better than many pints I've had in the pub"

BBC Radio 4 Food & drink programme (July 2000)

This man loves brewing. But he also loves life.

Bored with spending most of his time at home laboring over a brew he decided it was time to get out more. And now he can, thanks to Smugglers Special Premium Ale, Old Conkerwood Black Ale and Midas Touch Golden Ale - the Premium Gold range of brewkits from Muntons.

Because we use only the finest English 2-row barley and water, our kits give the same result you get from full grain mashing - except, it comes in a can, is a whole lot more convenient and frees up time to pursue life's other pleasures.

Since switching to kits our man has never looked back. He's still brewing great beer and enjoys sharing a round with friends. But his life has changed for the better with Premium Gold.

If you're a slave to full grain mashing, don't be! Switch to Muntons today.

Ask for Muntons Premium Gold at your nearest brew store.

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STEINBART WHOLESALE

RECIPE

Masterclass 3kg beer kits are pre-boiled - pre-hopped kits that also require no brewing sugar.

- Just take any Masterclass kit and mix with 4 pints of boiled water
- Add another 36 pints of cold water
- Stir, add yeast
- Wait and enjoy!

PAINE'S MALT LTD. range of Bulldog and Laaglander blends are simply the best concentrates made available in a can. Careful preparation, mashing and extraction has resulted in blends bursting with characteristic flavour and aroma. Brewers can customise their brew so no beer styles will be out of the reach of the extract brewer. With qualities available to suit all styles of beer, John Bull Bulldog and Laaglander blends offer infinite options to create unique beers every time you brew.

Pre-hopped Kit Styles AVAILABLE

JOHN BULL MASTER CLASS 3KG KITS

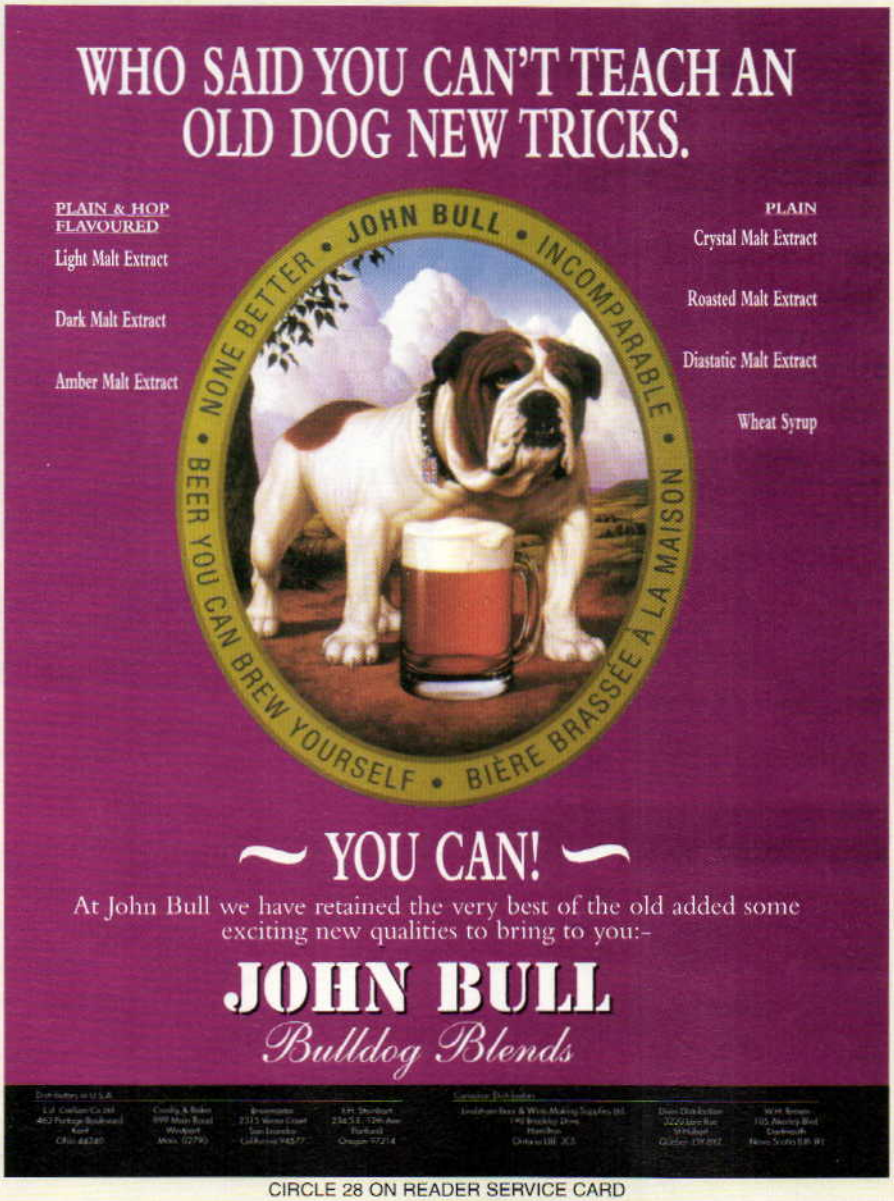
BAVARIAN LAGER
EXPORT PILSNER
BITTER EXECUTIVE
IRISH STOUT
INDIA PALE ALE
PORTER

JOHN BULL 1.8KG KITS

BEST BITTER
BEST LAGER
TRADITIONAL ENGLISH ALE
PILSNER
PORTER
MILD
STOUT
AMERICAN BEER
INDIA PALE ALE

LAAGLANDER 1.8KG KITS

DUTCH LIGHT
DUTCH BOCK
TRADITIONAL STRONG ALE
IRISH STOUT
IRISH ALE



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RECIPE

MountMellick Export Ale -

- Brew to the recipe on the can.
- Yields an all malt, beautiful, hoppy amber ale.
- Enjoy!

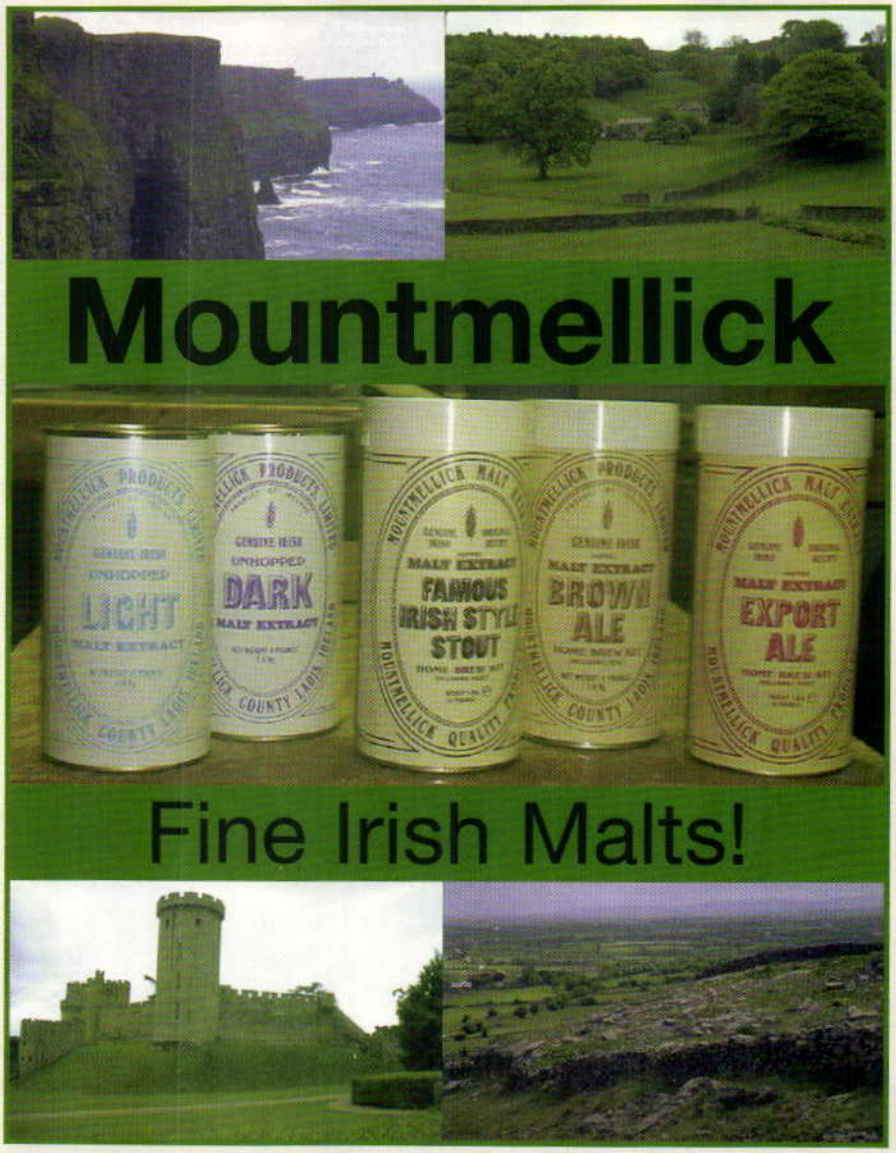
Pre-hopped Kit Styles AVAILABLE

EXPORT ALE

LIGHT LAGER

BROWN ALE

FAMOUS IRISH STOUT



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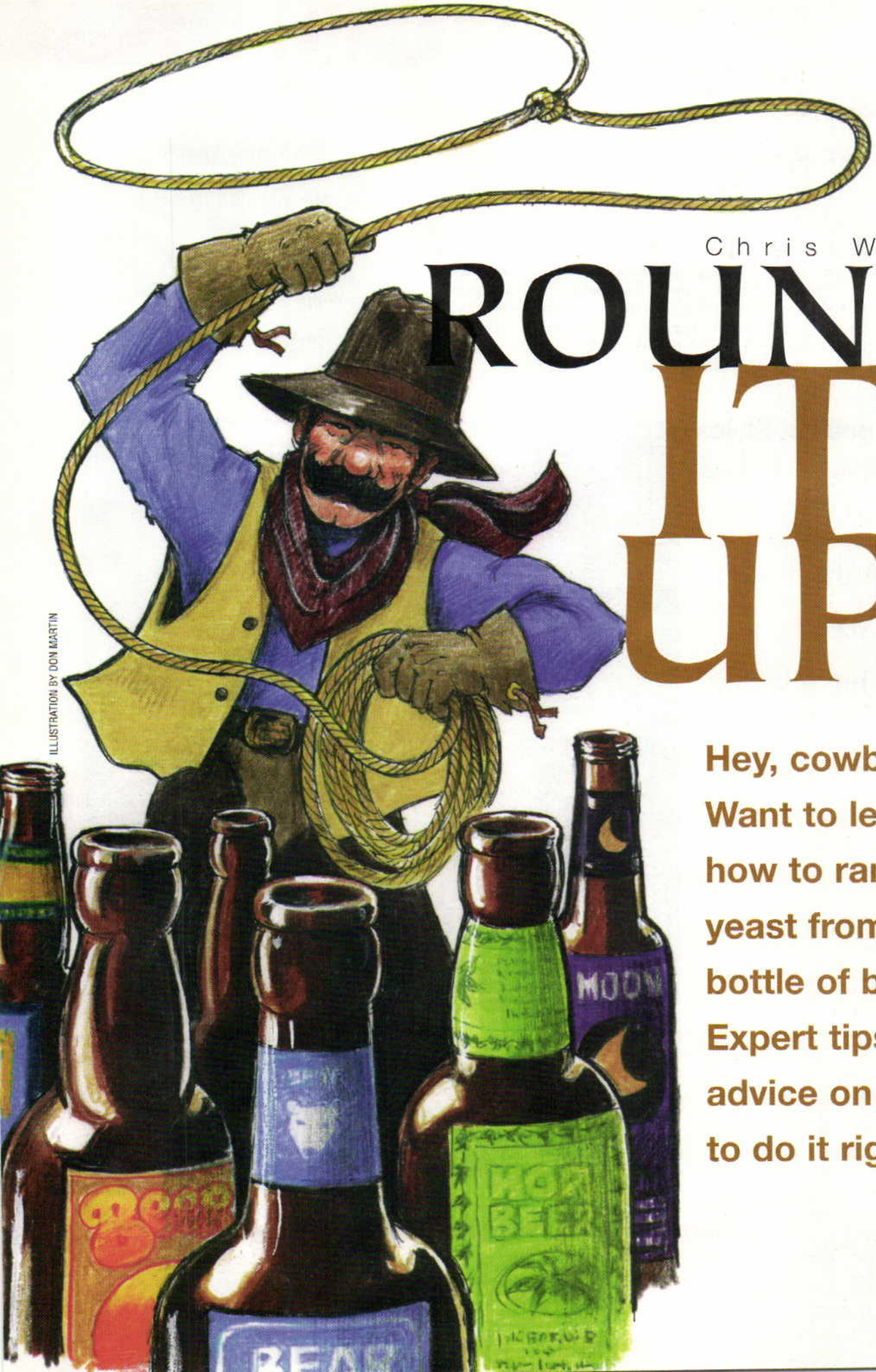

ILLUSTRATION BY DON MARTIN

by
Chris White

ROUND IT UP!

Hey, cowboy! Want to learn how to ranch yeast from a bottle of beer? Expert tips and advice on how to do it right.

HAVE YOU EVER THOUGHT about getting yeast from a bottle of beer? Wouldn't that be a great way to start brewing traditional beer styles? It can be, but as anyone who has ever tried to collect yeast from bottles will tell you, it can be a hit-or-miss affair. Well, cheer up. Collecting yeast from bottles is tricky, but the following tips just might help you achieve some success.

All beer is made by yeast. We let bacteria ride along in a few styles, but without yeast, there would be no beer. Yeast cells consume wort sugars and convert them into alcohol, carbon dioxide and flavor compounds. In some beers, the yeast is left in the beer when bottling. A successful "yeast rancher" can sometimes recover this yeast for use in homebrewing.

Why is yeast left in the bottle? It depends on the brewery. Some German hefeweizen brewers bottle with yeast as a matter of style. Some do it to enhance shelf life, and many breweries do it for cost. Breweries save money by not filtering the beer because it is one less step, and filtering material and equipment costs money.

Most homebrewers "bottle condition" their beer without thinking about it. Bottle conditioning means carbonating beer naturally in the bottle with a bit of priming sugar and yeast. Since most homebrews are not filtered, they always have some yeast in the bottle.

Even filtered beer can have some yeast in it. But it is hard to cultivate small quantities, and most likely you will be unsuccessful unless you have a well-stocked laboratory at your disposal. If the beer is pasteurized, your chances are extremely slim, since even if there were some cells left after filtering, they would have been killed by the pasteurization process. All canned beer is pasteurized.

Even when beers are bottled with yeast, it can be troublesome to collect *live* yeast. Sierra Nevada, for example, filters their beer and then adds yeast back when bottling. The yeast is added in order to develop natural carbonation in the bottle, rather then using compressed carbon dioxide. Many brewers feel this gives a better flavor to the beer. But the quantity of yeast added to the bottle is very small; indeed, many drinkers do not even notice the small yeast film at the bottom of the bottle. Many homebrewers have tried to obtain yeast from Sierra Nevada bottles, but have come up empty. Some of the reasons for that will be explored in this article.

What is the yeast condition in a bottle of beer?

Yeast is a single-cell organism, with an outer cell wall for rigidity and protection and a hydrophobic plasma membrane to create a barrier to water. As yeast sits in a bottle of beer, it will slowly strip the beer of any trace minerals and elements, even consuming some residual sugars. Once these components are gone, yeast will resort to feeding off dead cell material.

The danger of bottling with yeast is that it can provide nutritional value for bacteria and wild yeast to build in numbers in the bottle. The advantage is that they provide a natural oxygen scrub, in that they will consume any oxygen introduced during the bottling process. (Oxygen is evil number two to bottled beer. Bacteria is number one.) But it takes only very limited amounts of yeast to do this. You will notice that the pH will rise over time for bottled-conditioned beer. This is a result of cell lysis (death) and release of alkaline compounds into the medium.

What causes cell death? Alcohol, pressure (the build-up of carbon dioxide), temperature, handling, contamination with other microorganisms, and time are some factors. The more alcohol in a beer, the higher the proportion of cell death that will occur. Take a Belgian beer like Chimay, for example. Here you have a high-alcohol beer, combined with the fact that it was made in Belgium, shipped and imported, which takes time. Many imports are six months old (and sometimes much older), before being consumed. That is a very long time for yeast to sit in a high-alcohol environment.

In addition to cell death, living yeast can mutate during storage. Mutations happen when fragments of yeast DNA rearrange. Mutations are constantly occurring in brewers yeast DNA, but since brewers yeast has multiple copies of each chromosome, the mutations usually do not show an effect. But as mutations build up over time, they start to become noticeable in the yeast population. What types of mutations occur? You name it, but the most common mutations are flocculation changes, attenuation changes, petite mutants and flavor changes.

What causes mutations? The same reasons as for cell death above, but much more difficult to identify and quantify. Stress of any kind will cause yeast to react and can create mutants. Temperature change (either up or down), is one example of a stress on yeast that induces mutations.

The take-home message is that you should not expect yeast from a bottle-conditioned beer to perform exactly the same as it did at the original brewery. It is almost impossible to get commercial-grade quality yeast from bottle-conditioned beer, but you can get some nice, diverse yeast to use in a few homebrew batches.

Sources of bottle yeast

There is much speculation as to what yeast strain is used in a particular bottled beer — and most breweries try hard to protect this proprietary information. Sometimes a brewery will bottle their beer with a different yeast strain than they used in the fermentation. Some breweries just say they do that, but actually bottle with their fermentation yeast.

European imports provide a wealth of yeast varieties, but they often suffer from age and handling. Some beers that are bottle-conditioned for the European market are pasteurized before being shipped to North America, to increase their shelf life.

The beers that most homebrewers are interested in collecting yeast from are Belgian beers and hefeweizen beers. German-made hefeweizen beers are typically filtered, and lager yeast is added back at bottling. This not only keeps a primary flavor component out of the beer and away from yeast-stealing competitors, but it improves the shelf life by preventing the continual

development of phenol and clove character to the beer during storage.

Some Belgian beers are bottled with the original fermentation yeast. But in many cases the fermentation yeast is a mixture of strains. Often, there is an unintentional mixture of strains, meaning wild yeast contamination. Chimay is one beer that sparks a lot of debate about what yeast is in the bottle. It is in fact bottled with the primary fermentation yeast, but the yeast is no longer the same when collected out of the bottle (for some of the reasons stated earlier). That is probably why many people who have collected it, and used it, think that it is not true Chimay yeast.

Microbreweries are probably the best source of bottle-conditioned yeast. They will be the freshest, and usually have fairly high levels of yeast in the bottle. But many microbreweries do not have the money to invest in high quality bottling lines, so the level of contamination can be high at times.

There are many Internet discussion groups that attempt to assemble information on bottled-beer yeast identities. They are a decent resource, but remember that some of it is speculation and even accurate information can change at a moment's notice. A brewery may decide to start bottling with a different yeast or eliminate bottled yeast entirely. Your only sure bet is to collect some and try it out.

How do you get yeast out of the bottle?

Refrigerate the bottle for at least two days to get a nice yeast sediment in the bottom. Remove the bottle from the refrigerator and sanitize it, especially the rim area. Also sanitize a beer glass, a yeast collection vessel (a 50 mL test tube works great), and the surface you are working on.

It is best to have some 70 percent isopropanol (available in most drug stores) around to spray on surfaces. Remove the bottle cap with a sanitized opener, and pour the beer into a sanitized glass. Stop pouring when you get close to the sediment, and without tilting the bottle back up, swirl to stir up the yeast and add to your sanitized collection vessel. Cap and refrigerate if not using the same day. It will last for a couple of weeks in your refrigerator.

If you are successful at collecting yeast from a bottle, how do you know for sure that is not contaminated, and how do you know if it will work? Collect some and do a test batch.

What do you need to do with bottled yeast?

Collect it, test it, clean it up if necessary, and grow it up to the quantity you need. Here's how to proceed.

Once you have yeast in a collection jar, it should be tested. This can be done by simply inoculating 50 mL of wort with a very small portion (less than 5 mL) of the sample, allowing it to ferment for five days and tasting the final product or plating the yeast out on petri dishes. The plating technique has been covered in previous articles, including "Culture in Your Kitchen" *(March 2001)*. It will be summarized here to be complete.

Plates and slants are commonly used in all yeast and bacteria culturing. A semi-solid media (generally just called agar) is put into a petri dish or test tube. If it is a petri dish, it is called a plate, and if it is a test tube, it is called a slant. Slants are used for long-term storage (less than six months), and plates are used to work with yeast for the short term. For isolating yeast from bottled beer, plates are used. If you want to store the yeast after isolating it, it can be put on slants. Slants have a longer shelf life because they have a screw cap and don't dry out.

To plate a yeast sample collected from a bottle, dip a sterile inoculation loop into the yeast and streak it across the agar on the plate. Plates provide a check at the purity of your yeast, because most contaminants can grow and become a visible colony. This allows the average person without a high-power microscope to identify contaminants with the naked eye. It will show if there is bacteria in the sample. Bacteria can appear translucent or slimy with a clear, white or reddish-pink tint. Molds are easily spotted; they look like the mold that grows on bread.

You can also look at the different yeast colonies and evaluate whether they all look the same, or have major differences. Different colony types usually indicate different yeast strains. If there are different types, you can put each one separately into 50 mL test batches, and taste the result.

After inoculating small test batches, how do you choose the desired yeast? Choose the yeast that tastes and performs the best. A good indicator of wild yeast, for example, is little to no change in the specific gravity of the beer. That is why you want to test the yeast. You don't want to invest in ingredients for five gallons of beer, only to get a problem fermentation. Or perhaps the original fermentation culture was mixed; if you think that's the case, you might want to use 2 or 3 different strains from your separation.

Once you are confident the yeast is pure and of good brewing quality, it needs to be cultured to a volume for your brew batch. Healthy yeast grow in globs or in single colonies as round, creamy-white domes on the agar. Blisters around a colony can be a sign of wild yeast. Each colony contains millions of cells.

For a five-gallon batch of beer, you need at least 10 billion cells total. A 16-ounce bottle of beer will only have 1 to 500 million total cells. While it can sometimes work to do a one-stage starter from a bottle of beer, it is best to do at least two stages (10 mL and 400 mL, for example; see below).

The following steps should be followed when building up the yeast cell count in two stages:

1. Plate the yeast from the bottle of beer as described above.

2. Pick a single colony (small white disc of yeast) from plate and transfer to 10 mL of sterile wort in a test tube, being careful to open containers for the minimal time.

3. Prior to inoculating starter, flame opening, then insert loop with yeast and shake yeast into solution. Flame cap and tube, then snug cap. Unscrew cap slightly to allow oxygen transfer.

4. Shake starter to aerate and to mix yeast into suspension. Leave upright in a warm place (70 to 80° F).

Your 10mL starter is now inoculated and will grow over a period of 24 to 48 hours. It won't look like a normal fermentation; very little action will be seen at the top. Rather, a white sediment of yeast will appear on the bottom over the next two days, assuring you that growth has occurred. You should use this starter after approximately two days, however, it will keep if refrigerated after growth has occurred up to 7 days. Just remember to warm it to room temperature before proceeding to the next step.

5. When you are ready to grow your starter, boil 400 mL of water with 4 tablespoons of dry malt and some dry yeast nutrient. Add mixture to your sanitized Erlenmeyer flask. If you use a 1 liter Erlenmeyer flask, you can boil directly in the flask. If you use a 500 mL flask, it is preferable to boil separately, in order to avoid boilover.

There are two acceptable methods of sanitizing your flask. You may make up a chlorine solution of 1 tsp. bleach, add to Erlenmeyer and fill to top with water. Allow flask to soak for 15 minutes. Rinse with hot water, then cap top with aluminum foil.

Another method of sanitation is to place the flask, with a foil cap tightly molded around the lip of the flask, in the oven at 350° F for 2 hours. The bake method is preferred and may be done days in advance.

Once you have filled the Erlenmeyer with your hot boiled media, quickly place foil over the top, creating a cap. Allow to cool to room temperature, or cool to touch. You are now ready to add the 10 mL starter to the Erlenmeyer flask.

6. Tighten cap on 10 mL vial and shake to re-suspend yeast into solution. Unscrew cap slowly as there may now be pressure in the 10 mL vial, then flame opening while removing foil cap from flask. Flame opening of flask and dump in 10 mL vial, quickly replace foil and form tightly around opening. Shake Erlenmeyer flask to aerate and to mix yeast into solution.

Allow this to sit at warm temperatures (about 70° F) for 1 to 2 full days before use. Activity should be present within 12 to 24 hours. Again, activity will only be slight and will not produce the vigor of a five-gallon fermentation.

7. After 24 to 48 hours, swirl flask to mix the yeast into solution, remove foil, flame lip of flask and pour into five-gallon batch. Shake fermenter to aerate, then leave at recommended temperature. Activity should be present in 6 to 24 hours.

8. Ferment ales at 65 to 70° F, and lagers at 48 to 55° F.

Summary: Life on the ranch

A common technique among homebrewers is to simply take yeast sediment from the bottle and put it into a pint of wort. Theoretically the yeast grows up, and you can use it to make five gallons of beer. However, several problems can arise. First, if the beer has very little yeast in it (like Sierra Nevada Pale Ale), there may be very few live cells by the time you try and collect it. So the result is little to no activity in the pint starter. The other problem is mutated or contaminated yeast from bottles.

By plating the yeast out on agar petri dishes, you can assess the quality of the yeast before using it, and it gives you a chance to clean up a contaminated sample. You do this by carefully selecting health colonies with your loop and leaving bacteria and contaminants behind. By giving the yeast a test drive in 50 mL wort sample, you can taste whether you should continue. Of course, you could taste the pint starter as well.

Collecting yeast from bottle-conditioned beer can be a fun way to experiment with different yeast strains. If you know the type of yeast in the bottle, it can also be a good way to produce traditional beer styles. It can be done easily, but you can increase your chance for success by checking the yeast first. Good luck! ■

Chris White is founder and president of White Labs Inc., a yeast laboratory for craft and homebrewers. He holds a doctorate degree in biochemistry from the University of California at San Diego and currently spends half of his time as a lecturer in the UCSD department of chemistry and biochemistry.

Bottles to try

Most homebrewers "bottle condition" their beer, which means they carbonate it naturally with sugar and yeast. And very few homebrewers bother to filter their brew. So it's quite common to see yeast sediment at the bottom of a bottle of homebrew. But it's rare among commercial beers, many of which are filtered and carbonated with carbon dioxide. Still, some breweries do bottle-condition their beer — which means yeast ranchers have a chance to snag a few strains.

As this article explains, it's tough to know exactly what kind of yeast you're getting from a bottle of commercial beer. First, breweries don't like to release information about their proprietary yeast strains. Second, they may bottle with an entirely different yeast strain than the one used in fermentation. And finally, the yeast may have died or mutated in the bottle.

The good news is that more and more breweries seem to be bottle-conditioning their beer — and advertising that fact right on the bottle. Here is a quick list of a few commercial breweries that are commonly known to bottle-condition some or all of their beers. In general, Belgian ales and German weissbiers are likely candidates. Good luck with your ranching and let us know how your round-up goes!

Bridgeport (Portland, OR)
Cantillon (Brussels, Belgium)
Coopers (Adelaide, Australia)
Deschutes (Bend, OR)
Mendocino (Hopland, CA)
Ommegang (Cooperstown, NY)
Schneider (Kelheim, Germany)
Sierra Nevada (Chico, CA)
Unibroue (Chambly, QUE)
Westmalle (Malle, Belgium)
Worthington (Horsham, England)

—the BYO editors

HOPS explained

A simple guide to adding hops to your beer, plus the only formula you'll ever need for calculating your bittering hop additions.

by Horst Dornbusch

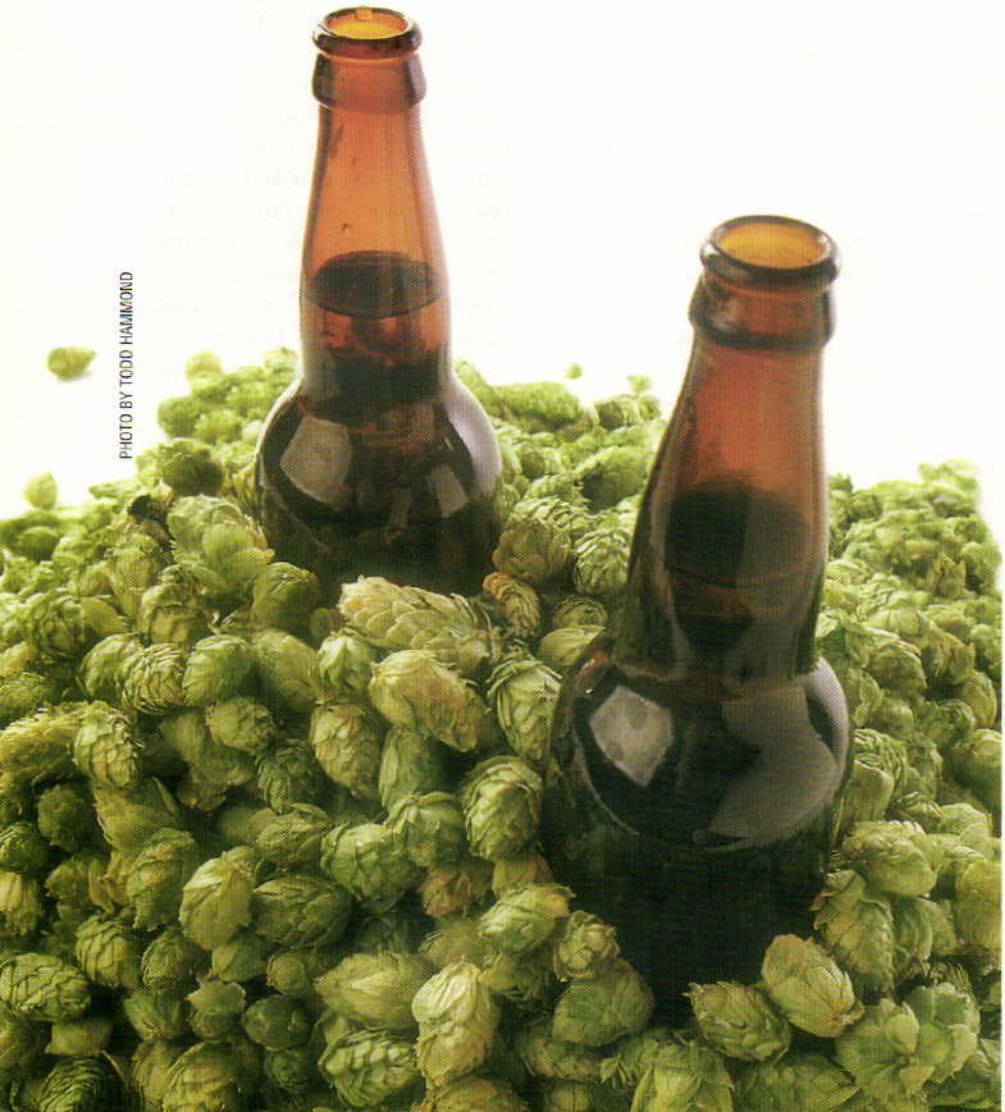

PHOTO BY TODD HAMMOND

THE EASIEST WAY to work with hops is, of course, not to. Simply buy a can of pre-hopped malt extract and let someone else worry about the hops. But this convenience comes at a price: You are left brewing with the malt producer's choice and amount of hops. This does not mean that you will be brewing inferior beer. But by selecting your own hops, you can experiment and expand your homebrew skills.

The key specifications on a hops package are quite easy to understand and calculating your own hops quantities from these specifications is a matter of applying one simple formula — the same formula the pros use. First, let's look at what the active ingredients in hops do for your beer. Then we'll delve into the math we need to master to control these ingredients.

The Anatomy of Beer Appeal: Bitterness, Flavor, Aroma

We'll start with a bit of botany: Hops is a wild and prolific creeping vine that belongs to the hemp family. Hemp, in turn, belongs to the order of nettles. There are only two species of

hops, and only one of these species, *humulus lupulus*, contains the resins needed to brew beer.

Only female hops are useful to brewers. Male hops don't have lupulin glands, and these glands are the source of hops' all-important bittering substances. Because male and female flowers normally develop on separate plants and only the female plants develop hop cones (which is where the lupulin glands reside), the two hop genders are usually easy to tell apart.

Brewers generally distinguish between three main contributions that hops make to beer: bitterness, flavor and aroma. Each of these terms describes different hop additions to the wort, as well as different active ingredients in the hops that are released during those additions. Simply put, the "bittering hops" addition gives beer its bitterness, the "flavor addition" adds flavor and the "aroma addition" adds aroma. Each of these additions balances the malty sweetness of the beer in a different way. Some of these ingredients are highly wort-soluble and even volatile — which means they evaporate easily — while others are soluble only after much heat and agitation. In addition to influencing beer taste, hops also help preserve beer.

Hop Bitterness

Hop bitterness is largely an up-front sensation. It can be extremely mild, as in a typical light American lager, or it can be downright mouth-puckering, as in some northern German pilsners.

The hops' bittering effect stems mostly from "alpha acids." These are soft resins with such tongue-twisting names as humulones, cohumulones, and adhumulones. Part of the taste variations between different hop varieties — and between the same variety in different growing years — stems from the difference in the relative proportions of these alpha acids in the lupulin glands. In general, though, humulones are by far the most abundant of these acids.

The alpha acids in hops remain relatively stable, as long as the cones (or the pellets made from cones) are stored cold and vacuum-packed in an oxygen-barrier pouch. (If you can smell the hops through the package, don't buy them.) Alpha acids only become wort-soluble after prolonged exposure to intense heat and physical agitation during the kettle boil. This process is called "isomerization." It involves the rearrangement of the molecule's atoms into iso-alpha acids.

When exposed to air instead of liquid, however, alpha acids oxidize over time, and this process accelerates in warm environments. Oxidized alpha acids are no longer wort-soluble and can, therefore, no longer contribute to the beer's bitterness. To make good beer, it is essential to use the freshest hops you can find and store them properly, in the refrigerator or the freezer, which greatly slows oxidation.

There is a second group of soft resins, beta acids. These resins also contribute to bitterness, but only marginally, if you are using fresh hops. The names of these beta acids are analogous to those for alpha acids: lupulones, colupulones and adlupulones.

Beta acids are about as stable as alpha acids, but, unlike alpha acids, they become more (not less) wort-soluble as they get old and become oxidized. Oxidized beta acids are called hulupones. Generally, the perceived bitterness derived from oxidized beta acids is milder than that derived from unoxidized alpha acids, and there are ways to calculate the relatively small contribution that beta acids make to beer bitterness. Commercial breweries tend to pay quite a bit of attention to beta acids, but, for practical homebrewers, their bittering contributions may not be worth quantifying, especially if we stick to fresh hops.

Hop Flavor

Flavor is the middle sensation that you experience while the beer fills your mouth. Much of it comes from volatile, ethereal hop oils that are released by the second hop addition to the wort. Hop flavor components have such impressive names as myrcene, humulene, caryophyllene and farnesene. They survive in a short, but not in a prolonged, rolling kettle boil. (They survive even better if not exposed to heat at all; in other words, in dry hopping.) Myrcene especially escapes quickly or oxidizes under exposure to heat. Because hops flavor comes primarily from hops added to the wort near or at the end of the boil, the timing of the flavor addition is crucial.

Hop Aroma

Aroma is the "nose" of the beer. It also stems from volatile oils and their derivatives and stays in the beer only if not exposed to high heat for any length of time. Hop aroma thus comes from hops that are best added after the boil, when the temperature of the wort starts to drop or even when the wort is cool. Roughly 180° F (or about 80° C) is a great temperature for adding aroma hops: The wort is still hot enough to sanitize the hops, but cool enough not to drive all of the volatiles immediately into the atmosphere.

Polyphenols as Preservatives

The astringent component of the hop flavor spectrum comes mostly from polyphenols, such as oxidized tannins. These are great wort-soluble preservatives, but, in excess, they would make our beer undrinkable. Fortunately, enough of them precipitate out into the trub during a vigorous boil so that the beer remains palatable.

So What's "Nobility" In Hops?

Many beers — especially German and Czech lagers — are made with so-called "noble" hops. Noble hops are merely different from, not better than, other hops. Hops are considered noble if they contain a relatively small proportion of the alpha acid cohumulone and a relatively high proportion of the flavorful oil humulene. There are four traditional noble varieties: Hallertauer, Tettnanger and Spalt (from southern Germany) and Saaz (from the Czech Republic). Modern botanical science has produced new varieties of noble-type hops, such as Mount Hood, which is a triploid variation of Hallertauer. (Triploids are plants that do not develop seeds and thus cannot reproduce.) New noble-type varieties generally grow well in the Pacific Northwest.

Measuring Hop Additions

While bittering can be estimated relatively easily in a homebrew kitchen (and the formula is explained below), you would need complex lab equipment to measure flavors and aromas. But there are several practical rules of thumb that let you determine how much flavor and aroma hops you need to achieve a desired effect.

The mathematically elusive nature of hops flavor and aroma is probably part of the reason why some authors use the terms "flavor" and "aroma" interchangeably and thereby create confusion. For our purposes, it is best to simply rely on the timing of the hops addition relative to the start and the end of the boil to distinguish between the two. Flavor hops are added very late in the boil, and they still contribute taste components (but not much bittering) to the beer, while aroma hops added at the end of the boil or later contribute mostly components that you can smell. They give the beer bouquet.

PHOTO BY IAN MACKENZIE

The packet says it all: the variety of hop, the amount and the alpha-acid rating. Hops should be vacuum packed to protect them from oxidation.

Bittering Calculations

In commercial brewing, bittering in wort or in beer is measured in International Bittering Units (IBUs). Let's get the technical definition out of the way, right up front: 1 IBU equals 1 milligram of dissolved iso-alpha acids in 1 liter of wort or beer.

Don't worry: At home, you will never need to actually measure the IBU value of your wort or finished beer. You would need a fancy lab for that. Instead, you only have to calculate the amount of hops needed to achieve the target IBU value as specified in your recipe. It's that simple.

To put IBU values for different beers in perspective, consider the following reference points: The common human taste threshold for bitterness is 4 IBUs in water and about 8 IBUs in beer. The upper solubility limit for iso-alpha acids in cold beer is roughly 100 IBU. The mildest American lagers may have an IBU level of 8, most ales and lagers have about 25 to 35 IBUs and IPAs, pilsners and barleywines may have 50 IBUs or more.

Many homebrew texts, including *Brew Your Own*, list hops in terms of Alpha Acid Units (AAUs). AAUs are the same as Homebrew Bittering Units (HBUs), which you also see in many homebrew books. The AAU was invented by Dave Line, the "father" of modern homebrewing, as a practical alternative to IBUs.

While working with AAUs has the advantage of simplicity, it also has the disadvantage of uncertainty, because AAUs do not relate to the volume of beer that you brew. One AAU is simply defined as 1 ounce (about 28 grams) of 1 percent alpha-acid hops. This is an easy way to express the amount of hops you add to your beer, but 5 AAU in a five-gallon batch will not lend the same amount of bitterness as 5 AAU in a ten-gallon batch. AAUs also do not account for any alpha acids lost during the brewing process. For these reasons, AAU does not relate the final bitterness of the beer. It is not possible, therefore, to construct a mathematical correlation or conversion between AAUs and IBUs.

Most recipes will contain a specification for the target bittering range in IBUs. If it does not, you can still use the formula below to calculate the bittering value you will actually get, but you can never be sure if this is the value the recipe author actually had in mind.

To hit target bittering values with the hops that you purchased, you need to know the hop's "alpha-acid rating," expressed in %AA. This is the minimum information that ought to be printed on any hops package and it is essential for working with hops.

The Formula

This is the only formula you will ever need to calculate your bittering hop additions to your kettle. If your recipe calls for two or more bittering hop additions, this formula tells you the total amount required for all additions. Note: Flavor and aroma hops quantities are *in addition to* the quantity calculated with this formula.

$$\text{Bittering hops (oz)} = \frac{(V \times IBU)}{(U \times \%AA \times 7500)}$$

To calculate kettle hops additions (in ounces), plug the target IBU value of your beer, your final batch volume (V) in gallons, the hop's alpha acid rating (%AA) and the hop utilization coefficient (U) of your system and process into this formula. We'll assume a hop utilization coefficient of 30% (0.3) for reasons I'll explain in a minute. Note: Be sure to use the final volume of your batch, not the volume you boil.

Here's a quick example. Say you brew a five-gallon (19 L) batch of beer with a target IBU of 25, and you use Mt. Hood bittering hops of 4.8% AA. You would use the formula as follows:

(5 x 25) ÷ (0.3 x 0.048 x 7500) = 125 ÷ 108 = 1.16

For this batch of beer, you would need roughly 1.16 ounces of bittering hops to hit the target IBUs.

Explanation of Variables

For all practical purposes, you have to guess the hops utilization coefficient (U). In theory, of course, all the alpha acids contained in the hops should be usable in the wort. In practice, however, the boil can extract only a portion of them. The precise amount depends on many factors, such as the length and vigor of the boil, the geometry of your kettle, and even the elevation of the place where you live.

The longer your boil, the better will be your hops utilization. In many commercial brew systems, hops utilization is about 28% for a 60-minute boil, 33% for a 90-minute boil and 38% for a 100-minute boil. The shape of your kettle may influence the amount of physical agitation during the boil. A rolling boil yields better utilization than does a placid one. Hops utilization is also greater at higher boiling temperatures. That's why some breweries boil their wort in a closed system under pressure. In an open kettle, the barometric pressure and thus boiling temperature decreases as your elevation increases. So you get less out of your hops in the mountains than you do in the plains. *(For a further discussion of hops utilization, see the sidebar at right.)*

Because the factors that influence hops utilization are difficult to measure, simply assume for starters that your hops utilization is 30% (or 0.3). Then brew your first batch with this formula, taste the finished beer and adjust your utilization figure accordingly. Note that alpha acid ratings are often listed on the hop package as, for instance, 4.8% AA or 11.6% AA. In our formula, this translates into 0.048 or 0.116, respectively.

Some authors recommend more complicated formulas for calculating the desired amount of bittering hops. They may include such factors as gravity correction values and the declining contributions of second, third and subsequent kettle hops additions to the

HOPS UTILIZATION

HOPS UTILIZATION EXPRESSES the percentage of bittering compounds that reach the final beer, compared to the amount of bittering compounds added during brewing. It's the laboratory measured amount of iso-alpha-acids in the beer divided by the amount of alpha acids added to the wort. For a homebrewer who lacks lab equipment, many factors conspire to make the true utilization coefficient in your system a matter of guesswork.

Wort Gravity

As the gravity or density of wort goes up, hops utilization goes down. If you are an extract brewer who relies on a concentrated wort boil, you should calculate the amount of bittering hops based on the final batch volume, not on the volume of concentrated wort that you boil. You should also consider that hops utilization deteriorates in the high-gravity environment of your boil. You may have to compensate by adding as much as 10% of bittering hops.

Protein Coagulation

When proteins coagulate during the boil, they attach themselves to the hops' polyphenols and alpha acids and take both "down" into the trub. Once enveloped by proteins, alpha acids will no longer isomerize. They will remain unsoluble and be lost for the bittering task. I recommend that hops not be added until 15 minutes into the boil, at which point most of the proteins have coagulated.

Boil Length

The length and vigor of the boil can also affect the amount of alpha acids extracted from the hops, as can the kettle geometry and the thermodynamics it produces. For a 60-minute boil, it may vary between 20% and 30% (some brewers believe these numbers should be reduced by 10 percent for whole hops; if you had 30 percent with pellets, you'd get 27 percent with whole hops). As a rough guideline, about half the bittering compounds are extracted into the wort during the first 30 minutes of the boil, with smaller amounts being extracted for every additional constant time interval.

Hops Age

Because alpha acids can oxidize (and thus become insoluble), hops utilization based on the original %AA is likely to deteriorate as hops get older. After one year, hops may have lost as much as 10 to 20 percent of their original alpha-acid content, even if stored in sealed containers in the refrigerator. The loss may be up 30 to 50 percent after about two years. Any hop that old you won't want to use anyway, because the oxidation will make it reek.

Wort pH

The pH of the wort, which is largely (but not entirely!) dependent on the hardness or softness of your brew water, also influences hops utilization. In areas with very soft, acidic water (resulting in a lower wort pH value), such as the town of Pilsen in the Czech Republic, brewers use greater amounts of hops. If you replicate such a brew with very hard water, you should reduce the target IBU figure. With brew water that is unusually hard (resulting in a relatively high wort pH-value), as is the case in Burton-on-Trent, a little hops can go a long way.

If your brew water is naturally soft or excessively hard and you do not treat your brewing liquor to correct it, adjust your target IBU value up for soft water or down for hard water.

—H.D.

aggregate amount of bittering compounds in the finished beer. Now, it is true that hops utilization decreases as wort gravity increases. It is also true that hop additions even late in the boil still contribute small amounts of alpha acids to the wort. But such mathematical precision loses its relevance to brewers who can only guess at the true hops utilization coefficient at work in their brew setup.

However, if you want to walk the extra mathematical mile, you can get a rough idea of the bittering contribution that the different hop additions, including the later flavor and aroma ones, make to the overall bitterness of your brew. Just use the above formula separately for each addition, and use approximately 30% U for the first addition, approximately 15% U for the second and 2% to 5% U for the third addition. Then add up the three IBU values to get the total bittering value.

The above assumes a flavor addition at 30 minutes before the end of the boil and an aroma addition about five minutes before the end. For different times, make a guesstimate based on these values.

Flavor and Aroma Hops

The alpha-acid strength of a given hops is generally no indication of its flavor and aroma potential, and the hop types for beer flavor and aroma naturally need not be the same as those used for bittering. In fact, many brewers use "high-alpha" hops for bittering (such as Chinook or Galena) only because this gives them a bigger alpha-bang for their hops buck. They then use noble hops (such as Hallertauer or Saaz) for the other two additions precisely because noble varieties have relatively high flavor and aroma potential, in spite of their relatively low bittering potential.

Volatile hop oils are the components that add aroma and flavor to the beer. The extent to which these oils and their derivatives stay in the wort and become part of the finished beer depends on many factors. Some of these factors are the timing of the addition, the quantity of hops and the variety of hops. Different varieties of hops

provide different amounts of aroma potential for a given weight. For example, East Kent Goldings typically contains about 0.5 percent volatile hop oils, while Cascade typically contains one percent. It's easy to see that for a given hop weight, the aroma potential may be vastly different.

There are a few simple rules of thumb that yield perfectly workable guidelines for flavor and aroma hops:

- For the average ale, calculate the amount of bittering hops as described in the formula above, then use about half that much in weight of whichever hops you choose for flavor. Then, for aroma, use the same amount as calculated for bittering.
- For a more delicately hopped beer, such as a Bavarian helles, use about a quarter of the amount of bittering hops, in weight, for flavor. For aroma, divide the calculated bittering amount in half.
- For an IPA or a Czech pilsner, both styles in which aroma must be pronounced, calculate your flavor hop as for ale. Then use up to one-and-a-half times the amount of aroma hops compared to bittering hops.
- If you want a truly simple approach, try this: For average ales, use about 4 to 6 grams per gallon of top-quality flavor hops near the end of the boil. Use about 8 to 12 grams per gallon of aroma hops after shutdown. For the average Bavarian lager, divide these ale quantities by two. For strongly aromatic beers, replicate the ale regimen, but be a bit more generous with the aroma hops.

Then, after a taste test of the fermented beer, adjust your hops amounts for your next brew, taking into account the flavor and aroma strength of the hops you use as well as your process choices. For your aroma yield, always consider the temperature of your wort at the last hop addition. The lower the temperature, the more volatile substances will stay in the wort and the less aroma hops you need.

Tasting the Result

The formula for bittering hops is fairly useful and straightforward within a certain margin of error. It is definitely much better than sheer guesswork. Use it to experiment with different hop varieties from different corners of the globe and see how the beer comes out. As homebrewers we should always emphasize the value of tasting and not get too hung up about theoretical analysis. If your beer has a flavor or aroma problem, simply keep careful notes of what you put into your brew, then take note of what your taste buds tell you, and adjust your quantities next time. After all, playing with ingredients is half the fun of homebrewing. The other half is drinking the fruits of your labor. ■

Horst Dornbusch is the author of "Altbier" and "Bavarian Helles," two books in the Classic Beer Style Series by Brewers Publications. He lives in Massachusetts.

Round out your recipe collection with 15 excellent extract recipes ... for 15 classic styles of beer.

Ever since we started homebrewing, one fact has stood out: If you have access to a good homebrew supplier, you're in clover. Whether you drop by, chat over the phone or exchange e-mail, a great store with a knowledgeable staff is a terrific resource.

Homebrew stores are a place where ideas and recipes accumulate, just waiting for the right person to walk in off the street. This collision of person and possibility often results in the genesis of really fine beer.

Homebrew retailers have their finger on the pulse of American homebrewing. They sell us the stuff we use to create the most humble and the most extravagant brews. They help us understand how ingredients, equipment and technique combine to create the perfect pint. If they're good, they make our hobby easy. After all, most retailers were homebrewers themselves, often for a very long time, before making the leap.

So every so often, we cast our nets and find out what's perking in our nation's brewstores. For this article, we asked two dozen homebrew stores from around the country to send us a favorite extract recipe. Then we selected fifteen responses, each of which represents a classic beer style. Some are the owner's own take on traditional styles like Oktoberfest and IPA, while others are more individualistic. One thing is certain: If you brew every one of these recipes, you'll have a homebrew style file that's definitely worth bragging about.

Each of these recipes makes five gallons of beer (except the Big Fist Barleywine) and is easy to brew. We hope you find them exciting. We can't wait to fire up the old brew kettle!

PHOTO BY CHARLES A. PARKER/IMAGES PLUS

Oktoberfest/Märzen

OG = 1.052 FG = 1.016 IBUs = 23

This full-bodied German lager has a toasted malt aroma and malty flavors. It uses two German crystal malts, which contribute distinctive caramel flavors. German noble hops are used for a very traditional rendition.

John M. Pastor
Grape & Granary
Akron, Ohio

Ingredients

6 oz. Durst German light crystal malt (20° Lovibond)
6 oz. Durst German dark crystal malt (80° Lovibond)
8 oz. Briess dextrin malt (grain)
1 lb. Durst light Munich malt
0.5 oz. Briess chocolate malt
6.6 lbs. Bierkeller light liquid extract (2 cans of syrup)
1 lb. Laaglander light dry malt extract
6 AAUs Tettnanger hops (1.5 oz. of 4% alpha acid)
2 AAUs Tettnanger hops (0.5 oz. of 4% alpha acid)
0.25 oz. Tettnanger hops
1/2 tsp. Irish moss
Bohemian Lager yeast (Wyeast 2124)
1-1/4 cup Muntons dry malt extract

Step by Step

Bring 2 to 3 gallons of water to 150° to 160° F. (If your water is chlorinated, run it through a charcoal-activated filter to remove the chlorine). Put specialty grains in a bag. Steep for 20 to 30 min. and remove. Add Bierkeller liquid malt extract and Laaglander dry malt extract (DME). Add first Tettnanger and bring mixture to a boil. Boil for 25 min., then add second Tettnanger and 1/2 tsp. of Irish moss. Boil 20 min., add last Tettnanger to final 3 to 5 min. of boil. When temperature is cool (70° F), add wort to sanitized fermenter, top up to 5 gallons and pitch yeast. Aerate well. Ferment at lager temperatures (45° to 55° F) until complete (6 to 8 weeks). After primary and secondary fermentation, rack, prime and bottle. Age 14 days at room temperature and 6 weeks at cellar temperature (50° F).

Hefeweizen

OG = 1.044 FG = 1.013 IBUs = 22

This hefeweizen is fashioned after the Widmer version. It's low on the traditional German wheat flavors of banana and clove that come from the tradional German yeasts. One unusual characteristic is the absence of aroma hops. The flaked wheat adds to the cloudiness of this beer.

Steve Bader
Bader Beer & Wine Supply, Inc.
Vancouver, Washington

Ingredients

4 lbs. Premier Brewers Wheat hopped malt extract kit
1 lb. light dry malt extract
1 lb. wheat dry malt extract
1 lb. flaked wheat
5 AAUs Tettnanger hops (1 oz. of 5% alpha acid)
American Hefeweizen yeast (White Labs WLP320) or American Wheat yeast (Wyeast 1010)
3/4 cup corn sugar for bottling

Step by Step

Steep 2 gallons of 150° F water with 1 pound of flaked wheat for 30 min. Strain out most of the flaked wheat, leaving some behind for cloudiness. Bring to a boil. Remove from heat and add the malt extracts and hops. Boil for 60 min. Chill the wort, transfer it into 2 gallons of cold water in your sterilized carboy, then top off to the 5-gallon mark with additional cold water. Add yeast when beer is cooled to under 74° F, then ferment at 68° F. Ferment to completion and bottle. Age 14 days at room temperature to carbonate and 4 to 6 weeks at 45° to 50° F.

Optional: Add natural fruit extract when you add your bottling sugar. Raspberry, apricot, marionberry and boysenberry all taste great. One bottle of extract will give a little hint of fruit flavor, while 1-1/2 bottles will give a strong flavor.

Amber Ale

OG = 1.072 FG = 1.010 IBUs = 60

This amber ale is a copper-red color, hoppy, with a nice caramel finish.

extract style file

by Joe and Dennis Fisher

This is balanced by the citrus character of the Centennial hops. This beer is a hophead's dream come true!

Dave Butterbaugh
Shreve Home Brewing and Wine Making Supply
Shreve, Ohio

Ingredients

0.5 lbs. Weissheimer Munich malt (or any Munich malt)
0.25 lbs. De Wolf-Cosyns "Special B" malt
0.5 lbs. Weissheimer medium caramel malt (or 60° L German crystal malt)
6.6 lbs. Coopers amber liquid malt extract (2 cans)
20 AAUs Centennial hops (2 oz. of 10% alpha acid)
1/2 tsp. Irish moss
American Ale yeast (Wyeast 1056)
1-1/2 cups light DME for priming

Step by Step

Bring at least 2 gallons of water to 150° F. Put grains in straining bag and steep for 30 min. Add all malt syrup and stir well before turning on heat. Bring to a boil. Add 1 oz. Centennial and boil 30 min. Then add 0.5 oz. Centennial and boil 15 min. Add remaining Centennial. Add Irish moss for at last 15 min. of the boil. Cool wort, pour into sanitized fermenter and top up to 5.5 gallons. When wort is at 70° to 75° F, pitch yeast.

Ferment at 60° to 65° F. When primary fermentation is finished, transfer to secondary for 1 week. Bottle and prime with 1-1/2 cups light DME for priming or keg. Age 14 days at room temperature to carbonate and 4 to 6 weeks at 45° to 55° F.

Poppa Piggy American Pale Ale

OG = 1.070 FG = 1.013 IBUs = 47

This award-winning recipe was developed by one of my customers, Jeremy Appel. Jeremy has this to say: "This American pale ale is quite hoppy and bitter, with plenty of hop aroma and a nice malt balance. Make a yeast starter, boil vigorously to help with hop extraction and be sure to dry-hop."

Doug Evans
VinBrew Supply
Canal Winchester, Ohio

Ingredients

0.5 lbs. Durst light Munich malt
0.5 lbs. of British crystal malt (60° Lovibond)
0.5 lbs. of De Wolf-Cosyns carapils
7 lbs. of Muntons light dry malt extract
6.6 AAUs Cascade hops (1 oz. of 6.6% alpha acid)
3.7 AAUs Willamette hops (0.50 oz. of 7.4% alpha acid)
6.6 AAUs Cascade hops (1 oz. of 6.6% alpha acid)
0.5 oz. Cascade hops
California Ale yeast (White Labs WLP001)
3/4 cup corn sugar for priming

Step by Step

Soak grains in 2 to 4 gallons of water 20 to 30 min. at 170° F, strain water into brew pot. Bring to boil, take off stove and add the malt extract. Stir and bring back to boil. Add first Cascade. Boil for 30 min., then add Willamette. Boil for 15 more min., then add second Cascade. Boil for 14 min., then add final Cascade. Chill wort down to 75° F, then add to fermenter with enough water to achieve 5.5 gallons of wort. When wort is at room temperature pitch yeast. Ferment at ale temperature (60° to 68° F) for 2 to 5 weeks. Bottle when complete. Age 14 days at room temperature to carbonate and 3 to 6 weeks at 45° to 55° F.

Big Fist Barleywine

OG = 1.127 FG = 1.025 IBUs = 53

Our homebrew club is called Brewers of the North East Section (BONES). Everybody in our club loves Sierra Nevada beers. With that in mind, here is a Bigfoot Clone, which I named Big Fist Barleywine. (It hits you in the face like a big fist). Please note this is a three-gallon batch.

Bill Wible
Brew By You
Philadelphia, Pennsylvania

Ingredients

4 lbs. Alexander's pale liquid malt extract
3.5 lbs. John Bull light liquid malt extract
2 lbs. Muntons light dry malt extract
8.25 AAUs Horizon hops (0.75 oz. of 11% alpha acid)
5.5 AAUs Cascade hops (1 oz. of 5.5% alpha acid)
1 oz. Cascade hops
0.5 oz. Centennial (dry hop)
California Ale (Wyeast 1056), White Labs (WLP001) or Scottish Ale yeast (Wyeast 1728)
3/4 cup corn sugar to prime

Step by Step

Bring 3 gallons water to a boil. Add malt extracts and stir to dissolve. Return to a boil. Add Horizon and boil 40 min. Add Cascade and boil 20 min. Add 1 oz. Cascade to final 5 min. of boil. Chill to 75° F. Transfer wort to fermenter and pitch yeast. Ferment at (60° to 68° F). When complete, rack to secondary and add Centennial dry hops for 2 weeks. Bottle when dry hopping is complete. Age 14 days at room temperature and 6 to 9 months at cellar temperature (50° to 55° F).

Saint Pat's Stout

OG = 1.068 FG = 1.014 IBUs = 35.8

Customers tell me they can't distinguish between this beer and draught Guinness. The lactic acid helps simulate the flavor. Adding it at bottling is recommended to allow the dry yeast (if that's what you use) to ferment rapidly. I add it at the start of fermentation and use Wyeast liquid Irish Ale yeast.

Mike Hanson
Hanson's Hobby Homebrewing, Inc.
The Home Brewery of Minnesota
Minneapolis, Minnesota

Ingredients

1.5 lb. flaked barley
0.75 lbs. ground roasted barley
6.6 lbs. Home Brewery light malt extract syrup
8 AAUs East Kent Golding Hops (2 oz. of 4% alpha acid)
1/4 tsp. Irish moss
8 oz. malto-dextrin (optional)
3/4 cup priming sugar
Whitbread or Doric dry yeast or liquid Irish Ale yeast (Wyeast 1084)
6 mL lactic acid (added at bottling)

Step by Step

Heat at least 2 gallons of water in a

5-gallon enamel or stainless-steel pot. Add the specialty grains to one or more grain bags. Heat the water to 150° F and hold for 15 to 30 min. Remove the grains and discard the grain bags. Add the malt extract syrup and continue to heat while stirring. Bring to a boil, add the Kent Goldings bittering hops and boil for 45 min. Add the Irish moss and malto-dextrin if desired. Boil for another 15 min. Turn off the heat and cool with a wort chiller or in a sink with cold water.

Transfer the wort to the fermenter and bring the volume up to 5 gallons. When the wort cools to about 75° F, pitch the yeast. Ferment at 65° to 68° F until bubbling through the airlock has stopped. Let stand 2 more days or rack into a secondary fermenter. Transfer to a bottling bucket, add priming sugar and lactic acid, and bottle. The beer should be ready to drink in 2 weeks to 1 month but improves with age.

Monkey Barrel ESB

OG = 1.059 FG = 1.012 IBUs = 45

We developed this recipe for the Route 82 Homebrewers Association. It was originally brewed in 20 individual batches. The 10 best batches were aged in a barrel at 55° F, then served at the 1997 AHA Conference in Cleveland. The character of this ESB comes from the use of Maris Otter malt, the extended hop schedule and Wyeast's London ESB yeast strain. The beer is full bodied, very complex and smooth.

Jim Leverentz
Leener's Brew Works
Northfield, Ohio

Ingredients

8 oz. Maris Otter malt
4 oz. English medium crystal malt (40 to 60° Lovibond)
2 oz. Belgian aromatic malt
2 oz. torrified wheat
3.3 lbs. John Bull plain light extract syrup
3 lbs. Muntons plain light DME
3.75 AAUs Styrian Goldings hops (0.75 oz. of 5% alpha acid)
3.75 AAUs Fuggles (0.75 oz. of 5% alpha acid)
1.25 AAU Fuggles (0.25 oz. of 5% alpha acid)
3.75 AAUs Styrian Goldings (0.75 oz. of 5% alpha acid)
0.5 oz. Styrian Goldings
London ESB Ale (Wyeast 1968)
0.5 oz. East Kent Goldings leaf hops (dry hop)
1 oz. untoasted white oak chips (optional)
2/3 cup extra light DME for priming

Step by Step

Steep grains in 2 gallons water at 160° F for 30 min. Strain out grains, add extracts and bring to a boil. Add Styrian Goldings and Fuggles. Boil 30 min. Add Fuggles. Boil 15 min. Add Styrian Goldings and boil 10 min. Add Styrian Goldings to final 5 min. of boil. Chill wort to 75° F. Strain into primary fermenter. Add water to make 5 gallons. Pitch yeast. Ferment at ale temperatures (60° to 68° F). When primary fermentation slows, rack off to secondary. Add East Kent Goldings dry hops and oak chips. Bottle after 5 days. Age 14 days at room temperature and 2 to 4 weeks at 50° to 55° F.

Schiffer am Dom Kölsch

OG = 1.048 FG = 1.009 IBUs = 32

I just returned from Cologne and Munich, where I had some of the best summer beers in the world. The city style of Cologne is the now-famous Kölsch. This is a deceptively simple beer. The key is to use very pale extract and good yeast.

Chris Schiffer
Northern Brewer, Ltd.
St. Paul, Minnesota

Ingredients

6 lbs. Alexander's pale malt syrup
7.2 AAUs Hallertau Tradition (1.2 oz of 6% alpha acid)
0.3 oz. Hallertau Tradition
1 qt. starter German Ale-Kölsch yeast (White Labs WLP029)
3/4 cup corn sugar for priming

Step by Step

Bring 2 gallons water to a boil. Add malt extract and stir to dissolve. Return to a boil and add Hallertau Tradition. Boil 55 min. Add Hallertau Tradition to last 5 min. of boil. Chill wort to 75° F. Transfer wort to fermenter, add water to make 5 gallons. Pitch yeast and ferment at around 65° F until specific gravity is around 1.016. Transfer to the secondary and lager for 3 weeks at 45° to 55° F. Bottle when lagering is complete and age 6 to 8 weeks at 45° F.

Elfstone Red Ale

OG = 1.058 FG = 1.010 IBUs = 19

This is a good red ale recipe that everyone seems to really like. It's a light, friendly, mellow sort of beer, not as strong as some other red ales you might encounter. It has great hops flavor and aroma.

Jim and Fran Jones
Beer & Wine By U
Evansville, Indiana

Ingredients

0.5 lbs. carapils malt
6.6 lbs. Northwestern light malt syrup
3 AAUs Nugget Hops (0.25 oz. of 12% alpha acid)
5 AAUs Spalt hop pellets (1 oz. of 5% alpha acid)
Australian Ale yeast (White Labs WLP009)
3/4 cup priming sugar

Step by Step

Bring 4 quarts water to 153° to 160° F. Place the grain in a steeping bag. Steep for 30 min. at 153° to 160° F. Remove the grains and discard. Stir in the liquid extract and bring to a boil. Add Nugget and boil 30 min. Add half of the Spalt hops and let boil for another 28 min. During the last 2 min. of the boil add the other half of the Spalt. Chill the wort to 75° F, then add to 1 gallon cold water in primary fermenter. Add cool water to bring mixture to the 5-gallon mark.

Pitch yeast. Ferment at ale temperatures (60° to 68° F). Bottle when fermentation is complete. Age 14 days at room temperature to carbonate and 1 month at 55° to 60° F before sampling.

Badass Blackberry Porter

OG = 1.056 to 1.065
FG = 1.015 to 1.020 IBUs = 61

This recipe has been a crowd favorite at the local beer fest and won a "people's choice" award. The black-

berries lend a unique flavor and the chocolate malt adds smoothness.

Dave Miller
A Brew Haus Inc. U-Brew
Jacksonville, Florida

Ingredients

0.25 lbs. flaked barley
0.25 lbs. roasted barley
1/8 lb. chocolate malt
0.25 lbs. crystal malt (60° Lovibond)
6 lbs. Muntons dark dry malt extract
12 AAUs Fuggles hops
(3 oz. of 4% alpha acid)
2 AAUs Tettnang hops
(0.50 oz. of 4% alpha acid)
English Ale yeast
(White Labs WLP002)
4 lbs. fresh blackberries or
1 to 1-1/2 bottles blackberry flavoring
1/4 cup dark DME for priming

Step by Step

Add cracked grains to brew pot and bring to 150° F for 30 min.. Remove grains and bring water to a boil. Add dark DME and boil 30 min. Add Fuggles hops. Boil 15 min. and add Tettnang hops. Boil 45 min. Cool wort and pitch yeast.

Ferment at ale temperatures until primary fermentation slows (5 to 14 days) and siphon to secondary. Add washed fruit or flavoring. If using fresh fruit you will have to rack a 3rd and possibly a 4th time for clarity. Bottle when beer has cleared. Age 4 to 6 weeks at cool temperatures.

Nut Buster IPA

OG = 1.060 to 1.065 FG = 1.012 to 1.015 IBUs = 72

Crack open a Nut Buster and enjoy the generous warmth from eight pounds of fermentables and a cool blast of hop flavor and bitterness.

Tracy Green
Old West Homebrew Supply
Colorado Springs, Colorado

Ingredients

1 lb. crystal malt (40° Lovibond)
0.50 lbs. torrified wheat
0.50 lbs. Briess Victory malt
0.25 lbs. roasted barley
0.25 lbs. biscuit malt
4 lbs. Alexander's pale extract syrup
3 lbs. Muntons amber dry malt extract
1 lb. Muntons light dry malt extract
10 AAUs Fuggles pellets
(2 oz. of 5% alpha acid)
12 AAUs Target pellets
(1 oz. of 12% alpha acid)
1 oz. Kent Goldings pellets
1 oz. Kent Goldings whole hops
(dry hop)
Edme Dry Ale or London ESB yeast
(Wyeast 1968)
3/4 cup priming sugar

Step by Step

Steep grains in 1.5 gallons of water at 155° F for 30 min. Strain out grains, add extracts and stir to dissolve. Bring to a boil, add Fuggles and boil 30 min. Add Target and boil 30 min. Add East Kent Goldings to last 5 min. of boil. Chill wort to 75° F. Strain into fermenter, top up with enough cold water to make 5 gallons.

Pitch yeast. When primary fermentation is complete, rack to secondary, and add East Kent Goldings dry hops for 1 to 2 weeks. Bottle when dry hopping is complete. Age 14 days at room temperature to carbonate and 4 weeks at cool temperatures before tasting.

Frahnkensteam

OG = 1.049 FG = 1.022 IBUs = 37

Compared to Anchor Steam, this beer is the same color but a bit cloudier. The head is not as big or as long-lasting, but it clings better. It has more body and is maltier and sweeter. All in all, a very good beer.

Scott Nelson
Stout Billy's
Portsmouth, New Hampshire

Ingredients

0.25 lbs. English two-row pale malt
0.25 lbs. crystal malt (60° Lovibond)
0.25 lbs. crystal malt (120° Lovibond)
6 lbs. light Muntons dried malt extract
9.75 AAUs Northern Brewer pellet hops (1.5 oz. of 6.5% alpha acid)
1/2 tsp. Irish moss
1 oz. Northern Brewer pellet hops
American Lager yeast (Wyeast 2035)
3/4 cup corn sugar for priming

Step by Step

Toast pale malt in a 375° F oven for 20 min. Crack it along with the crystal and steep in 2 quarts of 150° to 175° F water for 20 min. Sparge with 1 gallon of water. Dissolve DME in sparge water plus enough cold water to make 3.5 gallons. Boil for 10 min., add Northern Brewer, boil 35 min. Add Irish moss to last 15 min. of boil. Add Northern Brewer to last minute of boil. Chill to 75° F, top up to 5 gallons and pitch yeast. Ferment at ale temperatures (68° to 70° F) for 14 days or until complete. Bottle with priming sugar. Age 14 days at room temperature and 4 to 6 weeks at cool temperatures.

Bohemian Pilsner

OG = 1.048 to 1.055 FG = 1.012 to 1.018 IBUs = 43

This is a classic example of a Bohemian pilsner. It has a big malt character which is balanced by the spiciness of the Saaz hops. The softer the water, the better! (Hint: Dilute your water 50% with distilled water). With the Southern German Lager, this beer should be fermented around 48° to 52° F. If you can't obtain this temperature, use San Francisco Lager, which can be fermented between 58° to 65° F.

Olin Schultz
Beer, Beer and More Beer
Concord, California

Ingredients

7 lbs. Alexander's ultralight (pale) malt extract
4 oz. dextrin powder
8 oz. crystal malt (15° Lovibond)
6 AAUs Hallertauer hops
(1 oz. of 6% alpha acid) (bittering)
7.8 AAUs Saaz hops
(2 oz. of 3.9% alpha acid) (flavor)
7.8 AAUs Saaz hops
(2 oz. of 3.9% alpha acid) (aroma)
1 tsp. Irish moss
Southern German Lager (White Labs WLP838) or San Francisco Lager (WLP810)
3/4 cup corn sugar to prime

Step by Step

Start with as much water as your kettle can handle during the boil, making sure to account for about 1/2 gallon that the extract will add. Place the crystal in a bag and add it to the cool

water. Heat to about 160° F, then remove the grains. This steeping process should take about 15 min. or more. Bring the remaining water to a boil, cut heat and add the malt extract and dextrin powder. Turn heat back on. Once boiling again, add Hallertauer and boil for 60 min. With 20 min. left in the boil add the Irish moss. At 8 min. add 2 oz. of Saaz. For the last minute of the boil add the rest of the Saaz. Cover and cool to below 72° F.

Transfer to fermenter, pitch the yeast, and put in an area where you can lower the fermentation temperature over the course of 24 hours. The fermentation should be going by the time it hits the target fermentation temperature. After 5 to 7 days of fermentation, rack to a secondary fermenter and let it finish fermenting (as much as 3 more weeks). Next, rack to a bottling bucket, prime and bottle, being sure to pull through some yeast for conditioning. Let sit at fermentation temperature for 2 weeks. Test carbonation. If it is ready, bring temperature to 33° to 40° F for one month.

Autumnfest "Altimate" Altbier

OG = 1.042 to 1.045 FG = 1.010 to 1.015 IBUs = 77

Altbier is German for "old" beer, a reference to traditional top-fermentation methods. Alts are noted for bitterness with subdued hop flavor and aroma. They are full-bodied and drier than English ales, with a deep reddish-amber to brown color.

Alexis Hartung
Country Wines
Pittsburgh, Pennsylvania

Ingredients

8 oz. American crystal malt (40° Lovibond)
4 oz. American Vienna malt
4 oz. Briess Victory malt
2 oz. chocolate malt
6 lbs. Muntons unhopped light dry malt extract
4 oz. malto-dextrin powder
5 AAUs German Perle hop pellets (0.5 oz. of 10% alpha acid)
15 AAUs German Perle hop pellets (1.5 oz. of 10% alpha acid)
2.5 AAUs German Perle hop pellets (0.25 oz. of 10% alpha acid)
1 teaspoon Irish moss
Wyeast 1007 (German Ale), 1338 (European Ale) or 2565 (Kölsch) yeast
3/4 cup corn sugar for priming

Step by Step

Toast Victory malt at 325° F for 10 min. Crack lightly. Place in grain bag with the other cracked grains. Measure 2 gallons of water into your boiling pot. Place grain bag in the water. Heat the water to 160° to 170° F. Turn off heat. Cover pot and steep for 20 to 30 min.

Remove grain bag from the water; discard grains. Add malt extract and malto-dextrin. Bring to a boil. Add first Perle hops. Boil 20 min., stirring occasionally. Add second Perle. Boil 20 min.; stir occasionally. Add Irish moss

and final Perle. Boil 20 min. Total boil is 60 min. Chill wort, pour into sanitized fermenter, add cold water to make 5 gallons. Stir wort thoroughly.

When temperature is between 75° and 80° F, stir vigorously for 3 minutes. Pitch yeast (I make a starter culture several days in advance) and place in warm area (between 65° and 70° F). Fermentation will last 5 to 14 days and will be complete when SG is between 1.010 to 1.015. The SG should remain steady for about 3 days. Prime and bottle. Allow beer to age upright at room temperature for at least 15 days until carbonated. Then move it to cooler temperatures (30° to 35°F) for aging. Cold store for a minimum of 4 weeks.

Double Trouble Belgian Dubble

OG = 1.062 to 1.067 FG = 1.010 to 1.015 IBUs = 25.5

This is one of my favorite beers. It's definitely malty, with not much carbonation. I'd call it "semi-sweet." It's great served at 50° F for dessert. There's not a huge hop presence — but just enough hops to say "hey." The secret is Special B. That's an awesome malt; I could eat it with milk. Special B gives it that hint of nuttiness and roasted flavor. It's a well-rounded, very drinkable beer after a month in the bottle.

Kate Moss
Things Beer
Williamston, Michigan

Ingredients

4 oz. crystal malt (80° Lovibond)
4 oz. De Wolf-Cosyns Special B malt
6 lbs. Laaglander light malt extract syrup
1.5 lbs. Muntons light dry malt extract
3/4 lb. light candi sugar
4.5 AAUs Styrian Goldings hops (1 oz. of 4.5% alpha acid)
1.2 AAUs German Hallertau (0.3 oz of 4% alpha acid)
1/3 oz. Czech Saaz
Belgian Ale yeast (Wyeast 1214 or White Labs WLP550)
1/2 cup priming sugar

Step by Step

Place grain bag containing crushed crystal and Special B in two quarts of 150° F water. Hold for 30 min. Remove grains, rinse bag with another quart of hot water. Add this wort to your boiling pot with enough water to make 1-1/2 gallons total. With heat turned off, stir in the liquid and dry extract, making sure it is dissolved before turning the heat back up. Add candi sugar, Styrian Goldings and German Hallertau and boil for 55 minutes. Then add Czech Saaz and boil for an additional 5 minutes. Chill wort and transfer it to fermenter. Add cold water to make 5 gallons. As soon as it cools, pitch the yeast. Ferment at ale temperatures (60 to 68° F) for 8 to 12 weeks. Bottle when fermentation is complete. Age 14 days at room temperature to carbonate and 6 weeks at 50° F before tasting. ■

Joe and Dennis Fisher are the authors of "Great Beer From Kits" (Storey Publishing, 1996).

by Thomas J. Miller

Try a batch of the ultimate homebrew: It's potent, difficult and decidedly different.

Have you ever heard of wheatwine? If you know about this fairly obscure style of beer, consider yourself lucky, because wheatwine may be the ultimate homebrew. It's potent, a challenge to make and decidedly different.

Wheatwine is a style that seems to have arisen in the United States, most likely in California, during the craft-brewing revolution. But few breweries have attempted to master the recipe.

Wheatwine is similar to its well-known relative, barleywine, with one obvious exception: Wheatwine's primary ingredient is wheat. It's a bit like a doppel weizenbock, with different hops and yeast. Wheatwine is smooth, full-bodied and high in alcohol content. This beer packs a wallop and it's a worthwhile style for any intrepid homebrewer to master, whether you brew extract or all-grain.

Putting the beer together

When brewing an all-grain wheatwine, the biggest challenge is the high risk of a stuck mash: Because wheat malt lacks a husk, it's notorious for gumming up the mash. So my best advice is to be realistic about your brewing system. Can it handle 20 pounds of grain, including 13 pounds of wheat malt? If you have suffered a stuck mash with a normal beer, I suggest you start with an extract or perhaps a partial-mash version.

Recipes for wheatwine can vary. Start with the grain bill of your favorite doppel weizenbock, then adjust the hops and yeast. This brew won't have any clove or banana characteristics, like a German weizen. You want a clean and malty flavor that leans in the direction of barleywine. The color range can be broad. A golden hue is fine (just leave out the crystal). An amber color may extend all the way to russet. It should be clear and clean.

A wheatwine grain bill might look something like this: 32 percent pale two-row malt, 64 percent wheat malt and 4 percent crystal (40° Lovibond). This grain bill will give your beer a light amber hue and a nice caramel malt flavor. The OG will be around 1.100 and the IBUs should be about 60.

Try to take a tactical approach to handling your wheat grain. For starters, keep your barley and wheat separate. Crush the barley malt and

PHOTO COURTESY OF PAPAGO BREWING COMPANY

Wheatwine is like barleywine, except the primary ingredient is malted wheat. This tasty version is on tap at Papago Brewing Company in Scottsdale, Arizona.

crystal malt first, making certain that the crush is coarse. Just crack the grains open to expose the kernel and keep most of the husk intact. Then move on to the wheat malt. You'll find they are more brittle but try not to pulverize these fragile kernels.

You can take two approaches to mashing these grains. The standard method — throwing all the grains into the mash-tun until conversion, then transferring them to the lauter tun — risks a stuck mash. For that reason, I suggest one of the following methods.

Method One: Add a heavy dose of oat or rice hulls to the wheat grain (5 percent of the total malt bill). These replace the hulls that are missing from the wheat grain and create a natural filter bed. They are neutral in flavor and won't affect the beer's flavor.

Method Two: Use two mash tuns. The first is for the malted barley and caramel malt. The second is for the wheat grain and rice or oat hulls, with a small amount (5 pounds) of grain from the other malted barley batch added to aid in conversion. Transfer both batches to the lauter tun after each has achieved conversion and the iodine test is negative. Move the barley first to create a good filter bed. Let the barley settle for ten minutes. Then add the wheat grain on top.

If you have a mash-lauter tun fitted with a false bottom, you can still combine these methods. Add the oat or rice hulls to the wheat grain, and when you add the grains to the mash-lauter tun, put the malted barley on the bottom and the wheat on top. Don't stir.

The mash profile is straightforward with either method. A simple, single-temperature infusion at 152° F should get you a good conversion. Sparging and lautering proceeds as with any other brew, and the longer the sparge, the better. This allows the filter bed to get established, creating beautiful, clear wort. If you do get a stuck mash and need to stir it, recirculate again until you achieve clarity.

The Boil, Hops and Yeast

In the kettle, it's best to do a longer boil, whether you're working with extract or grains. This accommodates the high sugar levels and brings out some additional caramelization, which adds to the malty flavor of the finished product. A good target is 90 minutes.

You can adjust the hops to fit your preferences. Galena and Cascade are good choices. You're looking for about 60 IBUs. The bittering hops are boiled for 50 to 60 minutes. The Cascade goes in for 15 and 5 minutes. If you choose a fourth hop addition (at 30 minutes) and raise the IBUs a bit, you will reduce the malt character a bit in favor of more bitterness.

Your ale yeast strain will determine the final characteristics of your brew. English strains tend to emphasize the malt. With an optimal fermentation temperature between 65° to 70° F, the average homebrewer will have little problems managing fermentation. No adjuncts are added to the beer.

Once it is transferred to the fermenter, it is dropped to a temperature of 64° F for a two-week fermentation. The Papago Brewing Company in Scottsdale, Arizona, one of the few commercial breweries to make a wheatwine, uses White Labs WLP005 (British Ale). This, or a similar liquid ale yeast, will yield the smooth, balanced flavor you want. I age my wheatwines for three months, minimum, at the coldest temperature above freezing I can manage.

Whone Whicked Wheat Whine

(5 gallons, all grain)

OG = 1.111 FG = 1.027 IBU = 55

ABV = 11% SRM = 9.5

Ingredients

6 lbs. two-row pale malt
13 lbs. wheat malt
1 lb. crystal malt (40° Lovibond)
15 AAUs Galena hops
(1.25 oz. of 12% alpha acid)
3 AAUs Cascade hops
(0.5 oz. of 6% alpha acid)
3 AAUs Cascade hops
(0.5 oz. of 6% alpha acid)
British Ale Yeast (White Labs WLP005)
1/2 cup corn sugar for priming

Step by Step

Mash grains in 6.25 gallons water in a single infusion at 152° F for 60 minutes or until iodine test is negative. Mash-out at 165° F for 15 min. Sparge with 170° F water to collect 6 gallons. Total boil is 60 to 90 min. Add your bittering hops so they boil for 50 to 60 min. The second hop addition comes with 15 min. remaining in the boil. Add

the final hops 5 min. before the boil finishes. Chill to 65° F and pitch a one-quart starter of British ale yeast.

Ferment at 65° to 70° F. When krauesen drops back, check SG. Rack into secondary when gravity hits 1.015. Age at cellar temperatures (or lower) for 7 to 14 days. Bottle and prime. Condition in the bottle as long as desired (30 to 60 days minimum).

Easy Extract Wheatwine

(5 gallons, extract with grains)
OG = 1.098 FG = 1.025 IBU = 55

There are a few tips to keep in mind when brewing wheatwine with extract. First, be careful when stirring the extract into the brewing water. If you're using liquid extract, be sure it is all dissolved. If you're using dry extract, work with small increments to avoid clumping. Boost the temperature a bit as you stir in the extract to compensate for heat loss. Always try to keep the temperature near 170° F.

Avoid boilovers with a bigger kettle or a watchful eye and constant stirring. The wort will be heavily concentrated, which means it will be unstable and foamy. If foam starts to rise, remove from burner. After it settles down, put it back on high heat. Once the boil takes hold, you should be able to maintain a solid boil without boilovers. Finally, aerate the wort extremely well before pitching. The yeast need plenty of oxygen to ferment all that sugar.

Ingredients

0.5 pound crystal malt (40° Lovibond)
3 lbs. Briess amber liquid extract
10 lbs. Briess wheat liquid extract
15 AAUs Galena hops
(1.25 oz. of 12% alpha acid)
3 AAUs Cascade hops
(0.50 oz. of 6% alpha acid)
3 AAUs Cascade hops
(0.50 oz. of 6% alpha acid)
British Ale (White Labs WLP005)
1/2 tsp. Irish moss
3/4 cup corn sugar for priming

Step by Step

Put cracked grains in a cheesecloth bag and submerse them in 5.5 gal. cold water. Let the grain bag steep while the water is heating. Remove the grains when the water hits 170° F. Bring the water to a boil, turn off the heat and slowly stir in the extract. When the extract is dissolved, boil the wort. Add the hops as specified in the original recipe. Add the Irish moss 2 minutes before the end of boil. Cool rapidly to 65° F. Transfer to a fermenter. Pitch one quart yeast starter. Ferment with an airlock and move to secondary when the krauesen subsides. Age at or below fermentation temperatures. Bottle after 7 to 14 days. Boil the priming sugar in 3 cups of water, cool and add directly to secondary before bottling. Bottle and store at cellar temperatures for several weeks. ■

Thanks to Ron Kloth of Papago Brewing Company for his help in preparing this article.

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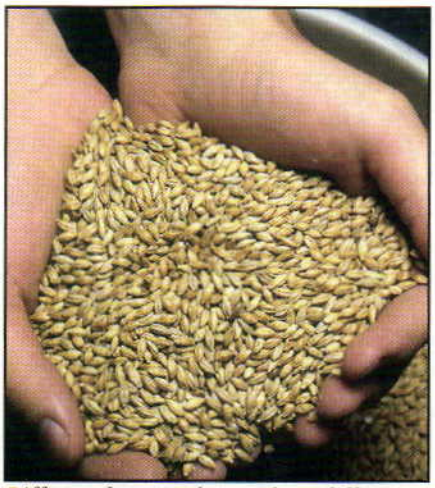
by Steve Parkes

Base Malt Basics

How to choose your main beer grain



Different base malts produce different flavors, so it's important to pick the proper malt when designing a beer.

SOME BREWERS TEND TO THINK OF base malt as a key source of fermentable sugar, protein, yeast nutrition and minerals — but not as a major contributor to beer flavor. These brewers are missing the point. In fact, the choice of a particular pale-colored malt — or "base" malt, as we sometimes call it — is a crucial decision when designing a beer in which the "malt" flavor is important.

Base malts account for most of the grain bill in many styles of beer. Different base malts produce different flavors, so it's critical to choose the right base malt when brewing a particular style. The base malt becomes even more important when brewing styles with lighter colors and delicate flavors. With a beer that highlights the flavors of darker and more flavorful specialty malts, like stouts, the base malt flavor is less important.

Flavors developed in malting

There aren't many things that taste or smell like malted barley. In fact, the word that's used to describe some of the compounds produced during kilning is "malty."

Barley must be converted into malt to produce the flavors we associate with beer. The maltster is responsible for producing malt that's acceptable to brewers in terms of two central criteria: brewery performance and extract efficiency. I recently attended a talk at which a representative from a leading malt company suggested adding "flavor" to that list of criteria.

"Modification" is the part of the malting process in which enzymes chemically re-arrange the structure of the barley kernel. Proteins are degraded, beta glucans are solubilized and starches are broken down. An extended modification period leads to increased levels of "cold water extract," which really means more soluble sugars and amino acids.

When these compounds are exposed to heat in low-moisture conditions, they combine in numerous ways to produce many flavor and color compounds. The simpler compounds give rise to flavors and the more complex give rise to colors. These reactions are known as "Maillard reactions" and occur in many food products that are exposed to similar low-moisture heat, such as baked breads or cured meats (browned toast is an example of the Maillard reaction). Also produced are compounds known as reductones that consume oxygen and may help stabilize finished beer.

Prolonged kilning also drives off unwanted flavors and aromas. One such aroma is dimethyl sulfide (DMS). This compound may smell of cooked corn when present in low levels and at high levels may resemble stewed cabbage, onion or garlic. It is formed from a pre-cursor called s-methyl methionine (SMM). SMM is converted to DMS by heat, so prolonged kilning first converts and then removes the potential to produce this flavor. Many drinkers who smell corn in their beer make the false assumption that corn was used in the recipe, due to this compound.

Base malts: a quick history

It is interesting to note that the beer styles made famous by each of the world's brewing regions are the products of prevailing brewing conditions and available ingredients. Just as a particular water type leads to a particular beer style, so too could a barley breed or a hop variety give rise to a region's signature beer. It is more likely that the brewing method employed in the Czech Republic (decoction mashing) or England (infusion mashing), for example, originally had more to do with barley and malting methods than a preference from the brewer.

In modern breweries, however, the brewers have an important role in determining the qualities of the malt they brew with. While allowances are still made for local weather conditions and the barley varieties that grow there, maltsters now produce malt to suit the brewer's needs.

Below is a guide to the five main kinds of base malt. Before I forge ahead, a caveat: This list is not comprehensive. Unique grains like peat malt and acid malt are considered base malts; specialty malts like Munich and Vienna can comprise 100 percent of the grain bill in some styles; and malts made with North American barley in the British tradition, such as Briess or Great Western pale ale malt, are becoming popular. But the five malts I discuss in this article are the building blocks for an enormous collection of common beer styles.

Traditional Bohemian pilsner

Bohemian pilsner is slightly darker than domestic malt (about 3 to 4 degrees Lovibond). It's low in protein (10 to 11 percent) and fairly undermodified. This base malt is famous for its golden color, viscous mouthfeel, sweet middle palate and bready but dry finish. These characteristics define the finished beer because of the under-

modified malt and the decoction mash system that's still employed in the Czech Republic.

It's possible to recreate all of these characteristics by using some of the specialty malts made available to us over the years, so I would not advocate a commercial brewery taking the time or expense to recreate the European decoction process. But homebrewers should be encouraged to experiment. In fact, homebrewers can buy malts that are made and intended specifically for a decoction mash.

Moravian barley is renowned for its brewing qualities and was once considered the finest in the world. The modification process is arrested long before it is complete, and the kilning process is deliberately carried out at lower temperatures. This results in less breakdown of the carbohydrates, protein and beta glucan in the grain and the survival of a higher proportion of the malt's enzymes, especially those that break down protein and beta glucan. Historically, all malt in this part of the world was made this way.

I once met a German brewer who complained that the "damned maltsters were doing all his work for him." He meant that a large portion of the protein, the beta glucan and the small starch granules had already been broken down and largely solubilized. So he didn't have to employ an interesting range of temperature rests and perhaps decoctions to deal with them in the brewhouse!

British pale ale malt

British pale ale malt is produced in the United Kingdom. The color is a bit darker (4 degrees Lovibond) and the barley is low in protein (9 to 11 percent). The malt is well-modified, dried to a low moisture specification and has more "malt" flavor. The grain bed will be bouyant in the mash tun and will yield good extract efficiency with a single temperature rest in the mash. In short, it's intended for brewers who make the traditional low-carbonation, cask-conditioned ales we think about when we think about British beers.

Brewers of these cask-conditioned beers have specific requirements of their malt. In an infusion mash it is vital that the malt be fully and evenly modified — not just from kernel to kernel, but also within each kernel. This is necessary for efficient wort separation.

To achieve this even modification, malting is carried slowly and at a cooler temperature. Cask beers are unfiltered, so the malt can't contain too much protein or the beer will be difficult to clarify. Historically, British brewers used fairly rudimentary mills, so they needed malt with a low moisture content (dry malt literally bursts apart in a simple mill). They also favored a single-temperature infusion mash — and had no method of temperature adjustment in the mash vessel — so low-moisture malt made hitting the correct mash temperature easier. These beers are fairly low in alcohol

content, so malt with a lot of flavor contribution was preferred. To achieve this low moisture, and yield stronger flavors in the finished beer, the malt is kilned longer and at higher temperatures than its European counterparts. This means it has fewer enzymes, since more of them are destroyed by the heat of the kiln. Any hope that there would be any enzymes present capable of breaking down complex proteins is a vain one, so brewers skip all the rests and use a compromise temperature at which the key enzymes that break down starch are active.

Barley variety is more important to British brewers, since many insist on using a single variety of barley malt for their recipes. The most famous variety may be Maris Otter, which has a long-established reputation for producing full-bodied, clean-tasting, clear beer. In Scotland I used a variety called Golden Promise; it provides the unique flavor profile that I associate with Scottish beers.

European pilsner malt

This malt is low in color (2 degrees Lovibond) and low to medium in protein (10 to 11 percent). It's high in enzymes, extract and potential DMS. It's used for European lager, which happens to be the leading kind of beer produced these days in Britain.

As the popularity of European lager rose in the United Kingdom, British brewers found it difficult to brew these light-colored beers using traditional British pale ale malt. So maltsters began producing an even paler malt, which brings with it other issues. The lager malt is less extensively kilned, which results in higher moisture and more DMS potential. The result is that the DMS flavor is an integral part of beers brewed in this region of the world, and should be present in beers that represent the style well.

A friend of mine who trained in Germany and now works at a major brewery was concerned about the DMS in his German pilsner. We both agreed it was a little high but needed to be noticeable. The need to use a higher level of brewing adjuncts results in a parallel need for higher levels of enzyme in the base malt. Adjuncts are used to dilute color, dilute troublesome nitrogen (protein) and dilute flavor. They also improve flavor stability. As a friend once said when asked why he used 25 percent sugar in his kettle, "that's 25 percent of the ingredients I don't have to worry about."

North American six-row

North American six-row malt is pale in color (less than 2 degrees Lovibond) and high in protein (12 to 13 percent). It's extremely high in enzyme potential to take advantage of the fact that a lot of adjunct starch will be used in the brew. It's ideal for low-color, low-flavor, high-adjunct beers such as Budweiser, Miller and Coors.

There are essentially two types of barley grown in America. With six-row barley, the kernels are arranged

around the stalk in threes (the triads are offset and look like six when viewed down the axis of the head). With two-row barley, the kernels are in pairs. Six-row barley varieties are only grown in North America and malt from Europe is always two-row.

Six-row kernels tend to be long, thin and narrow, while the two-row tend to be plumper. The six-row have less endosperm and more husk. Six-row barley is malted with the production of pale-colored, light-bodied, mild-tasting lager beers in mind. Six-row has a high enzyme potential, as indicated by its higher nitrogen level, and it is kilned for a low color. It will provide a slightly lower extract potential.

The brewer will use up to 50 percent non-malt adjunct, which will dilute the nitrogen considerably, along with the reserve of enzymes. This means that brewers usually will perform a low temperature rest in the mash to increase the amino acid level of the wort. This helps ensure that there is plenty of nutrition for the yeast. They will also allow the temperature of the mash to rise slowly through the different active ranges of the two starch degrading enzymes to ensure a controlled degree of fermentability in the final beer.

North American two-row

Domestic two-row malt is pale in color (less than 2 degrees Lovibond) and high in protein (12 to 13 percent). It has slightly less enzyme potential than six-row and slightly more extract potential. It is used as the main base malt in a wide range of beer styles. Produced by maltsters to big brewery specifications, this malt will support high levels of adjunct.

A lot of homebrewers — and small commercial brewers, for that matter — are guilty of thinking of two-row as the ideal malt for brewing British ales. It actually should be used to make fine American ales. But bear in mind that this malt, like six-row, is made predominantly for the large producers of pale lagers. Again, maltsters maximize the enzyme potential, care a little less about nitrogen, kiln lightly for a paler color, and leave the moisture content a little high. This malt can be used in infusion mashes. One advantage of having such an enormous surplus of conversion enzymes is the fact that the conversion of starch to fermentable and unfermentable extract in the mash tun is very rapid. The light kilning can lead to the inappropriate appearance of DMS in ales, so great care must be taken in the boil to guard against this. Brewers commonly use only a few varieties — such as Harrington, which is higher in protein and DMS potential. Maltsters also sell a blend of two or three barley varieties as their "two-row malt blend." ■

Steve Parkes is the owner and lead instructor at the American Brewers Guild in Woodland, California.

Steel hopback

Make a no-weld stainless model

by Thom Cannell

PHOTOS BY THOM CANNELL

The final product: Note the bulkhead fittings for both the inlet and outlet.

A closer view of your finished hopback with my favorite stainless sheathing.

The parts: fittings, a tubing cutter, tubing bender, flare tools and hose.

Measure the hole locations, leaving enough room at the top and bottom.

We all love the aroma of fresh hops, that floral-bitter explosion you sniff when you open a new bag, the bouquet that fills the brewhouse after you toss several handfuls into the boiling pot. Don't you wish you could capture that magnificent fragrance in every bottle of pale ale, IPA, mild, blonde or pilsner that you brew? Well, now you can. And at the same time, you can achieve a clearer, cleaner runoff than you've ever had before. What you want, what you need, is a stainless-steel hopback, an ancient device we will update for modern brewing at a primitive price of $30.

What is a hopback?

At its most basic, a hopback is simply a container, filled with hops, that is placed between the boil kettle and the fermenter. The hopback allows hot, near-boiling wort to pass through fresh hops in a sealed environment just prior to being chilled. The enclosed container keeps the aroma of the hops from being driven off in the heat.

A hopback can be as high-tech as the commercially-used mash tun with a screen or as simple as a Choreboy stainless-steel scrubber in a standard one-quart glass Mason jar *(see "Homemade Hopbacks," April 2000).* Hot wort extracts aroma, not flavor or bitterness, from the hops and is simultaneously filtered by them. This clarifies your beer in addition to improving its character. After the hot wort is run through the hopback, the wort is immediately chilled to capture the aroma and keep it in the beer. Using a hopback is different from dry hopping. This is mainly due to heat. The hot wort is thought to affect the hop oil compounds and thus the aroma profile.

All you need to make a hopback is a way to get hot wort into a closed container — no nasty oxygen molecules please — and a way to get it out again through a filter. I first thought of using a stainless-steel restaurant condiment container and lid, a bit of pipe and a bit of silicone seal to create a gasket. Then, while shopping at a Bed, Bath and Beyond store, I spied a better solution: a stainless-steel, sealable canister that is meant to be used for holding coffee or flour — and to serve as my hopback. While the clear plastic lid with its built-in seal and bail-type lock are not meant to be immersed in boiling liquid, it is surely robust enough for our use. And it's dishwasher safe.

Design simplicity dictates that we should put the liquid in from the top and take it out from the bottom. Billions of bath tubs can't be wrong. So I planned on making two holes in the container and putting one bulkhead fitting (a sealed pipe that pierces the container wall) near the lid and another near the bottom. The hot wort would enter the container, then be directed to the bottom by a copper (stainless steel

Parts List

($1) Two nylon barb to MIP adapters ($^3/_8$-inch x $^1/_2$-inch)

($1.75) Two female pipe couplings ($^1/_2$-inch)

($1.55) Two flare to MIP half unions ($^3/_8$-inch x $^1/_2$-inch)

($0.90) Two short rod nuts ($^3/_8$-inch)

($0.50) One 4- to 8-inch piece $^3/_8$-inch copper or stainless steel pipe *or*

($5) One 6- to 8-inch piece stainless steel flexible hose covering (24-inch)

($14.00) One container (Bed Bath & Beyond)

($0.10) Two to four $^3/_4$-inch O-rings

($0.05) Two to four $^1/_8$- to $^1/_4$-inch shims or washers (made from scrap)

is preferred) pipe. Less splashing means less hot-side aeration. Hot-side aeration should be avoided since it is widely believed to lead to a cardboard-like off-flavor.

The next thing to consider was how to get the incoming wort to fully saturate the hops before exiting the container. I decided to use some kind of perforated tube inside the steel canister, from which multiple streams of wort would spray out and wet the hops. This is when I realized that my new favorite homebrewing material, the woven stainless-steel sheath around flexible water pipe, would provide a very acceptable "perforated" tube for this job.

Then I needed a filter medium. So I returned to the product that has impressed me the most in past do-it-yourself projects — more of that stainless-steel flexible sheathing. A semi-circle of stainless flex would serve to filter out hops just fine. With these decisions made, I started my project.

1. Purchase Fittings

First, purchase the container. You can use a stainless-steel canister like the one I used, or you can find some other sealable box.

2. Assemble Your Tools

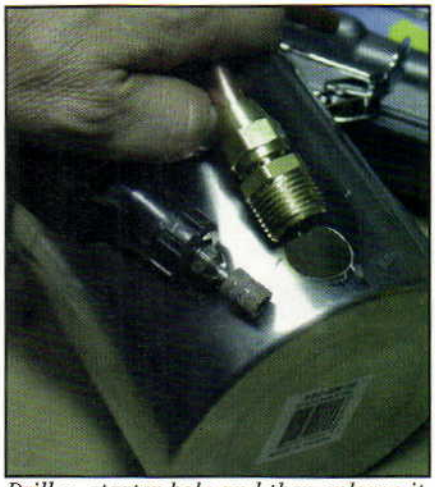
You'll need your container, the parts to make two bulkhead fittings that will go through the container wall, a tubing cutter, a spring-type tubing bender, flare fitting tools and the stainless-steel flexible hose that we will use for both the filter and the inlet tube.

3. Measure Hole Locations

Next, you need to measure your inlet and outlet hole placements. Mark the placements with a marking pen. This will be a rough measure and you need to leave enough room at the top for your lid and at the bottom for the large internal fitting.

4. Drill Holes and Enlarge to Fit

Use a punch to mark your starting location and drill a 1/8-inch starter hole. Drill progressively larger holes up to the maximum diameter drill you own. I would suggest buying the largest drill bit necessary and sharing the cost with some brew buddies. Otherwise you will have use a file or Dremel tool to grind the opening to the



Drill a starter hole and then enlarge it progressively until it fits.

There are two options for bulkhead fittings: stainless flex or copper tube.

final size. I had to do this, and it took me forty minutes.

5. Make the Inlet Bulkhead Fitting

For introducing wort — it will be near boiling — a direct connection between the kettle and the hopback would be best. I don't yet have quick disconnects, so I used reinforced, high-temp, food-grade flexible tubing to move wort from kettle to hopback.

To fill the canister with wort, I offer two options: copper tube and flex tube. In either case the object is to direct hot wort to fill the canister, then filter it completely and equally through your bed of fresh hops.

To decide which method is best for you, I would make the decision based on kettle output. If your kettle filtration system really works, use the stainless flex method. If your runoff includes a good amount of trub, an open-ended tube might be less likely to clog.

Stainless-flex option: On the inside of the container, another flare fitting makes connecting a bit of stainless flex as simple as the filter. Crimp and seal the discharge end, then slip a rod nut over the open end and push the flex onto the flare fitting. Screw gently.

Copper-tube option: Cut a piece of stainless-steel or copper tube to a larger size than you need, approximately 4 inches to 6 inches. Install the rod nut if you're using a flare fitting, and flare one end of the tube.

Next, bend the tube to 90 degrees or as required. I recommend spending $5 and buying a set of the spring-type tubing benders, or other tube benders, to save headaches when the tube collapses. If you're using a compression fitting, install the gasket. Cut excess length from the tube, leaving the discharge end close to but not touching either the top or side of your container.

6. Make the Outlet Bulkhead Fitting

Cut your stainless-steel flex from its parent and remove the plastic inner tube. One end of the flex must be closed, either by crimping or sealing. I chose to crimp it, then silver solder it shut. Crimping and sealing with some silicone seal (it's rated to 250°+F) will work just as well. I would suggest using a flare fitting to connect the flex to your bulkhead fitting. Pinching the tube will collapse it to the correct size.

Then just slip the rod nut over it and secure it to the coupling.

7. Assemble with O-rings

When your bulkhead fittings are complete, you will notice that because of the thin wall of the container the assembly has more slop than a baseball through a basketball hoop. This is because pipe fittings wedge together, unlike a straight-cut nut and bolt. The easiest solution is to adjust tightness with O-rings, or homemade plastic or metal washers and an O-ring. The exotic solution is to recut the male pipe thread (MPT) of the male pipe using a pipe die run backwards. Whatever your decision, you'll need to seal the threads with Teflon pipe tape or Teflon food-grade pipe dope.

That's all there is to it. You now are the owner of an exotic hopback with a stainless-steel discharge and a stainless-steel woven filter, all assembled and ready to go. This means that you can clone your favorite beers with all

Hot from the Hopback

MARK GARETZ, THE AUTHOR of "Using Hops" (HopTech, 1994), says "a hopback is nothing more than a strainer. Originally, it was a large, slotted iron plate or a loose-weave cloth that the hot wort was poured through to catch the spent hops. It held the hops back." (Thus the origin of the name "hopback.") "Brewers discovered that if they put fresh hops into the hopback it imparted a nice hop aroma and character to the beer, though this was not the intended purpose. In modern times, the hopback's only purpose is to add hop character and aroma to the beer. The trub and spent hop removal is usually done with a whirlpool or other filter devices in commercial breweries."

Some people might recommend putting your beer through a hopback after chilling, to encourage cold break. Garetz gives two reasons why you shouldn't do this. "The heat of the wort is necessary to extract the hop oils because the contact time is so short. And hops are not a sterile product. They contain bacteria and wild yeast. The heat of the hot wort kills everything, but if the wort is cold, you are simply asking for trouble."

In a related hop note, this also explains why you don't want to dry hop in the primary. According to Garetz: "You should wait until the secondary (or until the kraeusen falls, if you're using a single container) before you dry hop. By the time you rack (after the kraeusen falls), the low beer pH and alcohol (and the established yeast population) all work to inhibit the growth of anything that might be on the hops. Another reason is that most of the hop aroma will be lost because the carbon dioxide will scrub it out."

Install the rod nut on the flare fitting and flare one end. Bend tube to 90°.

The input fitting: All the parts you need to assemble the top bulkhead.

of the fresh hop aroma that your nose desires. Now that you've built it, how do you use it?

How to Use a Hopback

Since opinions vary, I chatted with George "Murf" Murphy Junior, head brewer at the Arcadia Brewing Company. Murf uses what he calls the "hop percolator" to create his signature Arcadia IPA, a beer that captures buckets of hop aroma.

"We don't use the hop percolator strictly as a hopback," Murf says. "We start by adding 170° F water to the hop percolator to sanitize the hops and get some isomerization. Then we start running the hot wort through it. It's my observation that within 20 minutes or so you have extracted all the aroma from the hops — which is usually before the runoff is complete. So if your runoff goes longer than 20 minutes, you could actually bypass the hopback at that point. I prefer to keep it connected, because we also use the hop percolator for filtration purposes. The hopback holds back particulates."

Here's my recommendation for using your shiny new hopback. When the boil is over, connect your sanitized hopback to the brewkettle with a suitable length of sanitized high-temp tubing. Toss in a few ounces of your favorite fresh whole hops. Run in enough hot wort to fill the container and push out all the trapped air, then clamp the tubing and let it steep for several minutes to sanitize the container and the hops. Or, like Murf, you could add 170° F water and hold for several minutes to sanitize the hops.

Then begin your runoff, tweaking flow rates with the kettle valve (or the hopback valve, if you've decided to add one). Be sure you keep the liquid level in the hopback very high or full. ■

Thom Cannell writes the "Projects" column in every issue of BYO. He lives in Lansing, Michigan and is a veteran automotive editor and writer.

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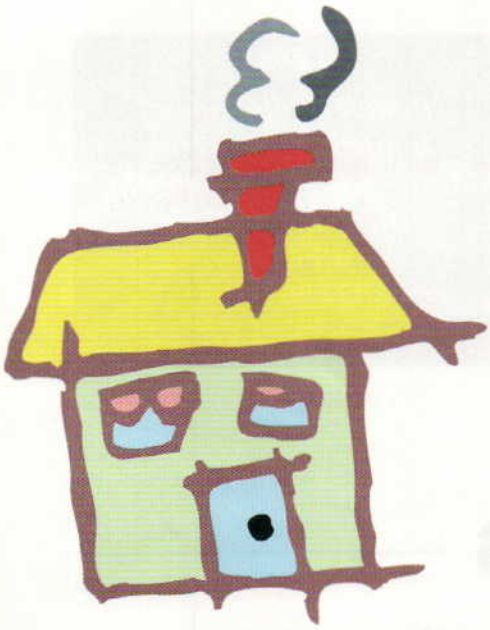
From basement brewery to playland

by Tammy Stone-Gordon



The dance floor was covered with kiddie carpet and toy trucks and our fantasy brewspace became a playland.

When we finally found ourselves in a position to buy a house — gainfully employed after years of overeducation — we weren't quite sure what we were looking for. But when we saw the house at 3109 Liberty Drive, we knew this was it. If one thing influenced our purchase, it was the basement. It was magnificent. Eight hundred and fifty square feet of homebrew possibility, divided evenly between the twin joys of homebrewing: brewing and tasting. Down the stairs and to the left was the brew side, complete with a deep, divided cement sink for bottle washing and a sturdy shelf for cool storage. The right side had been finished in varnished knotty pine and had a spacious dance floor to the south and a bar to the north. The bar was finished in knotty pine and topped with gold-flecked linoleum. Behind the bar we found all the appropriate cupboards for glasses and supplies and a space wired for a refrigerator.

We moved in within a week, three full carboys seat-belted into the front of a rental truck. We imaginined the past occupants and their uses of the "rec room." While the wife probably spent hours preparing for guests, some of the duties had to fall to the husband. This was probably a time, in the 1950s, when every respectable suburban male knew how to mix at least five different drinks and to serve them on special bar napkins. When the 3.6 children had been tucked in, adults retired to the rec room with their friends and, surrounded by shiny knotty pine, sipped mixed drinks with names resembling their own – Tom Collins, Harvey Wallbanger, Jim Beam.

Our vision of the space matched our own times. Known more for Halloween parties than martinis, we pictured our popular pumpkin ale and apple jack being passed over the gold-speckled bar. The home entertaining possibilities seemed endless. But before we could hang up our "WWBD: What Would Bacchus Do?" sign over the bar, we had our first baby. Having grossly underestimated our own fertility, we had her just ten months from the day we moved in. Another one came soon after. Needless to say, this changed our vision for our brewspace.

First, we found ourselves brewing for birth announcements and thank-you gifts. We gave out bottles of wine with birth notices attached to them. People brought us cribs, blankets, diapers, casseroles and advice, and we reciprocated with porter, brown ale and stout. While our friends loved the brew, they also suspected it had secret fertility-enhancing ingredients.

The parent-homebrewer combination also presented some obvious challenges — the hazards of large pots of hot liquids to toddlers, lack of time and an increasing lack of space. The dance floor in the basement was covered with kiddie carpet and toy trucks and our fantasy brewspace became a playland.

But our hobby has lately been making a comeback. With the help of industrial-strength birth control and some sharpened organizational skills, we're now in a position to keep our kids and our hobby, too. We now host brew parties with other brewing parents. Kiddie carpet rolls up easily off the dance floor (kids make great dance partners) and root beer can be just as challenging as your average prickly pear cactus mead. We've even started to imagine the years ahead — say, force-carbonated cherry cola as the winning sixth-grade Science Fair project and grandchildren in whose honor we will make watermelon wine with birth announcements as labels. Our brewspace didn't turn out exactly as we intended, but our fantasy homebrewery has become a real home. ■

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If you don't have the time nor the inclination to brew your beers starting from the raw grain, or perhaps you think that brewing is as difficult as brain surgery but you don't have a high opinion of beer from beer kits, we recommend you try a **BREWFERM** home brew kit. The results may well surprise you! **BREWFERM** use nothing but the finest ingredients in their kits, and their beers are tailored to demanding Belgian tastes.
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DARK ABBEY type for 9 l.
Starting specific gravity : 1.070 Alcohol content : 8 %.
One of the most well known Belgian specialties : an Abbey style beer with vinous character due to its high alcohol content. Deep amber, full flavoured with lots of malt aroma with caramel notes. Improves with long maturation times and can be kept for several years !

AMBIORIX type for 15 l.
Starting specific gravity : 1. 060 Alcohol content : 6,5 %.
Amber beer with a red copper tint. Slightly acidic palate at first but with a nice fruity aroma. Moderate hop bitterness. Comparable with the well known beer of Roeselare.

DIABOLO type for 9 l.
Starting specific gravity : 1.071 Alcohol content : 8 %.
Belgian specialty beer : Strong, golden coloured beer with a thick and long lasting head (lacy). Characteristic aroma of devil type Belgian beers, soft palate with a slightly sweet aftertaste. Improves with long maturation times and can be kept for several years !

KRIEK type for 12 l.
Starting specific gravity : 1.053 Alcohol content : 5,5 %.
Kriek is the best known of the famous Belgian fruit-beers, made by macerating cherries in beer. A slightly acidic, sweet aromatic beer with a red topper tint. Each kit contains pure cherry juice of at least 3 kg of cherries ! This beer gives you the perfect balance of fruitiness without tasting like grenadine as some commercial kriek's do.

OLD FLEMISH BROWN type for 12 l.
Starting specific gravity : 1.060 Alcohol content : 6 %.
A dark brown beer with a woody notes flavor a slight liquorice aftertaste that also compares with the Dutch Bock-beers.

CHRISTMAS type for 7 l.
Starting specific gravity : 1.065 Alcohol content : 8%.
Dark, strong and full-bodied Belgian beer, sweeter than Abbey style beers. Strong malt flavour and aroma. Improves with long maturation times and can be kept for several years !

WHEATBEER type for 9 l.
Starting specific gravity : 1.053 Alcohol content : 5%.
Very similar to the well known Belgian "Witbieren" : pale, opaline colour with low alcohol content. A real summer beer with a pleasant aroma, mild hops and a smooth malt character. Slightly acidic and thirstquenching. Based on an old recipe using barley, wheat, oat flakes and a secret herb mixture with coriander and sweet orange-peel.

GRAND CRU type for 9 l.
Starting specific gravity : 1.075 Alcohol content : 8%.
Gold opaline coloured, with strong flavour of grains and even bread. Very little hop aroma. Very mouthfull with light fruit notes and a pleasant sweetness. Also this kit contains wheat malt and a special herb mixture.

TRIPLE type for 9 l.
Starting specific gravity : 1.075 Alcohol content : 8%.
Triple is a well known, deep golden coloured, Belgian specialty. Due to its high malt contents it has a very pleasant aroma and taste, mouthfull, full bodied and even a bit herbaceous. High alcohol content.

FRAMBOOS type for 12 l.
Starting specific gravity : 1.053 Alcohol content : 5,5%.
FRAMBOISE or raspberry beer, is a Belgian specialty. Together with the BREWFERM KRIEK, this FRAMBOISE is the only fruitbeer kit available in the world. Each kit has an equivalent of 2 kilo of raspberries. This FRAMBOISE beer han a very delicate aroma and is ideal as a refreshing summer-beer or as a surprising aperitif !

PILSNER type for 15 l.
Starting specific gravity : 1.042 Alcohol content : 4,6 %.
Light, blond beer, with a moderate bitterness and dry finish, comparable with the commercial Lager or Pilsner beers. Low alcohol content.

GOLD type for 12 l.
Starting specific gravity : 1.053 Alcohol content : 5,5 %.
A real deluxe pilsner type with more malt flavor than the normal Lagers. Moderate hop bitterness. Comparable with the Scandinavian deluxe-Beers.

GALLIA type for 12 l.
Starting specific gravity : 1.055, Alcohol content : 5,5 %.
The latest addition in our range: A thirstquenching pale amber beer with a refined bitterness and a soft finish, a worthy alternative to the commercial Belgian ales.

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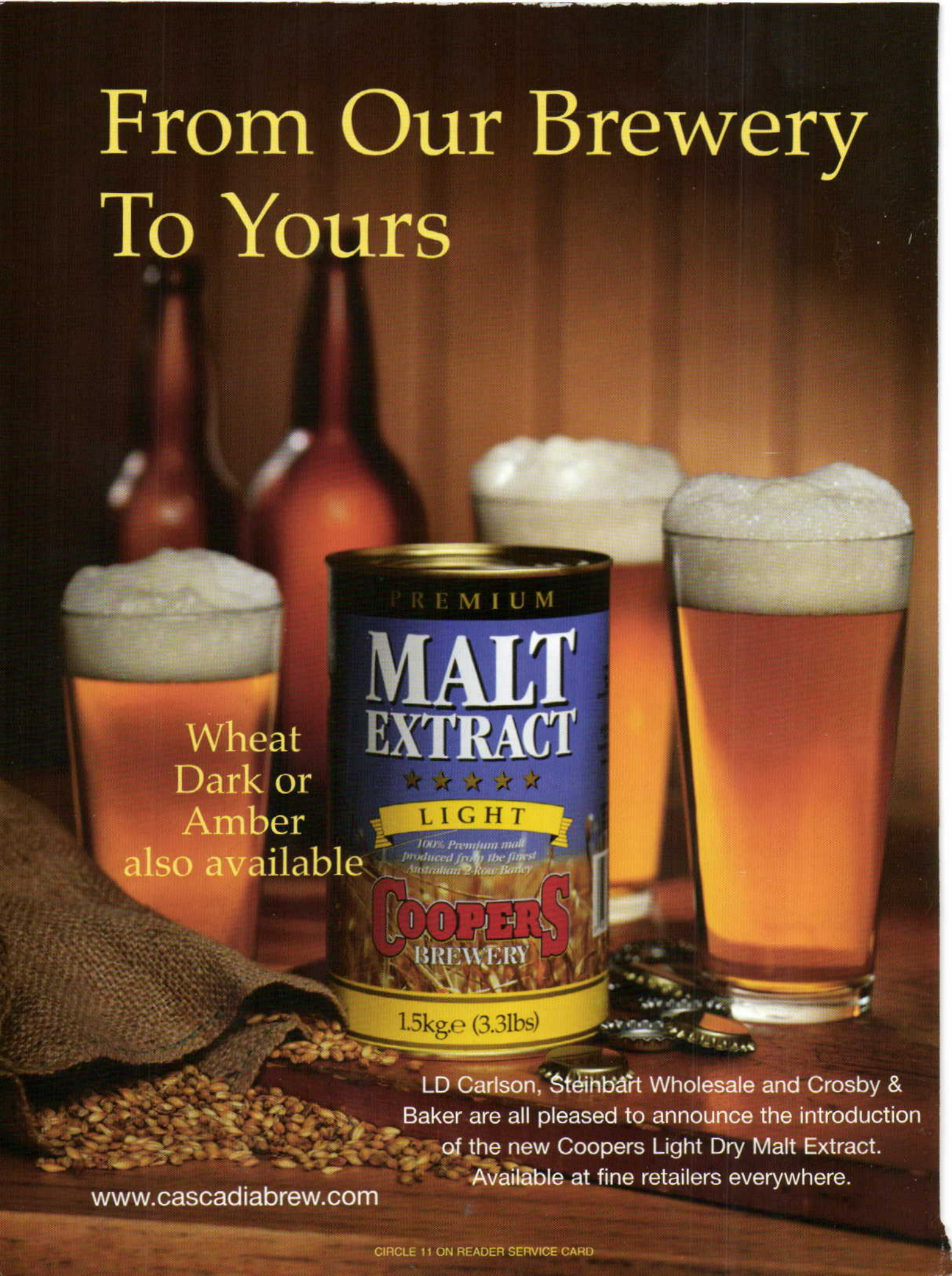
B-3581 Beverlo - Belgium
info@brewferm.com - www.brewferm.com

From Our Brewery To Yours



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