WINNERS INSIDE!

award-winning labels

BrewingTHE HOW-TO HOMEBREW BEER MAGAZINE

JULY-AUGUST 2007, VOL.13, NO.4

15 GREAT SUMMER HOMEBREW RECIPES!

LET'S GET SMALL!
brewing solutions for small living spaces

BUILD A YEAST STARTER STIR PLATE

BREWING BELGIAN WIT

www.byo.com
U.S. $4.99 • CAN. $5.99

$4.99US $5.99CAN

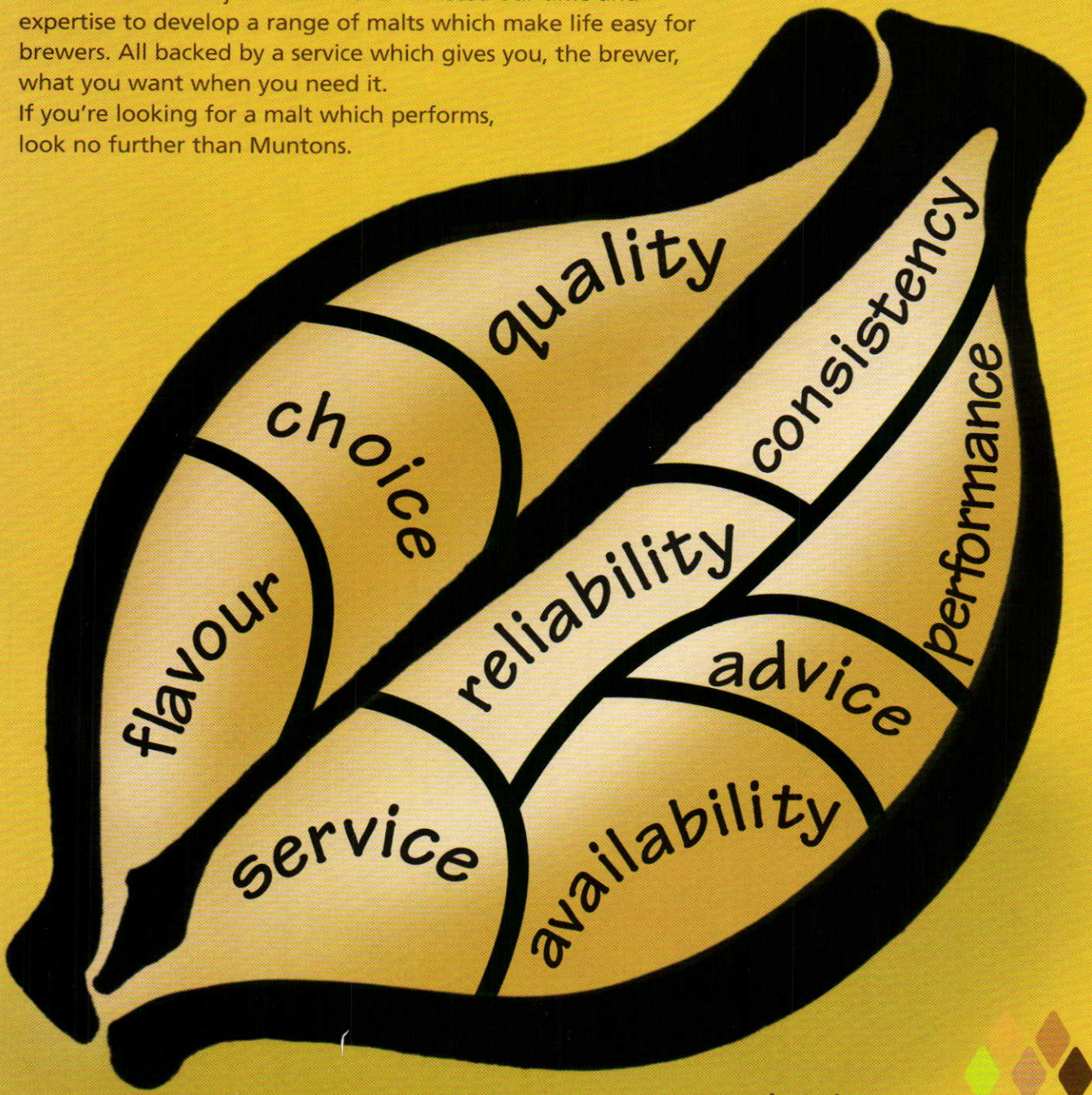
08>

0 71486 02485 9

PLUS: developing your own homebrew experiments

Malt with a brain for brewing

Busy brewers expect their malt to perform. Every time. And Muntons Malts do just that. We've invested our time and expertise to develop a range of malts which make life easy for brewers. All backed by a service which gives you, the brewer, what you want when you need it.
If you're looking for a malt which performs, look no further than Muntons.



Muntons

WORLD CLASS MALT

Muntons PLC, Cedars Maltings, Stowmarket, Suffolk, IP14 2AG, England Tel (+44) (0) 1449 618300 Fax (+44) (0) 1449 677800 email james.smith@muntons.com
www.muntons.com

BLICHMANN™
engineering

The Gear For Beer!

THERMINATOR™
Stainless Wort Chiller
- Fast! - chill 10 gal in 5 min!
- Fastest and smallest chiller available!
- Ultra low restriction
- Ideal for southern climates!

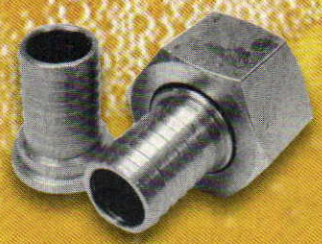
BREWMOMETER™
Brewing Thermometer
- Unique "made-for-brewing" dial face
- Best weldless design available
- 1/2" NPT connection available too!

THRUMOMETER™
In-line Thermometer
- Set your counterflow chiller to ideal fermentation temperature
- Super easy to sanitize
- One-piece construction - no threads to hide bacteria!
- Saves water!

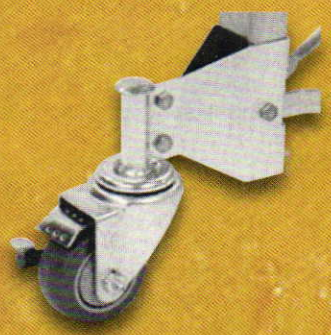
FERMENTATOR™
- Stainless Construction
- 7, 14.5, 27 & 42 gal sizes!
- More capacity!
- 3pc ball valves
- Pressurizeable for CO_2 pumping
- Folding handles

New! 42 gallon gross capacity (1bbl batch size)
Add capacity to your 27 gallon F3 Fermenator™
Modular design! *New!*

QUICKCONNECTOR™
Stainless Quick Connect Fittings
- No tools reqd to install!
- No crevices to hide bacteria
- Fits all 1/2" NPT fittings
- 3/8" and 1/2" hose sizes



CASTERS *New!*
- Fits all F2 and F3 models
- Super heavy duty casters
- Non marking locking wheels
- Outriggers for stability
- Not compatible with leg extensions



BEERGUN™
Bottle Filler - Revolutionary design!
- One hand intuitive operation
- Low foaming
- Easy to clean
- Stainless construction
- Superior to counter-pressure!

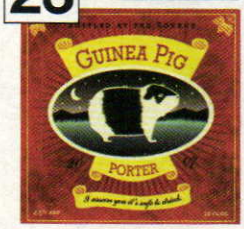
www.BlichmannEngineering.com

JULY-AUGUST 2007
Volume 13 Number 4

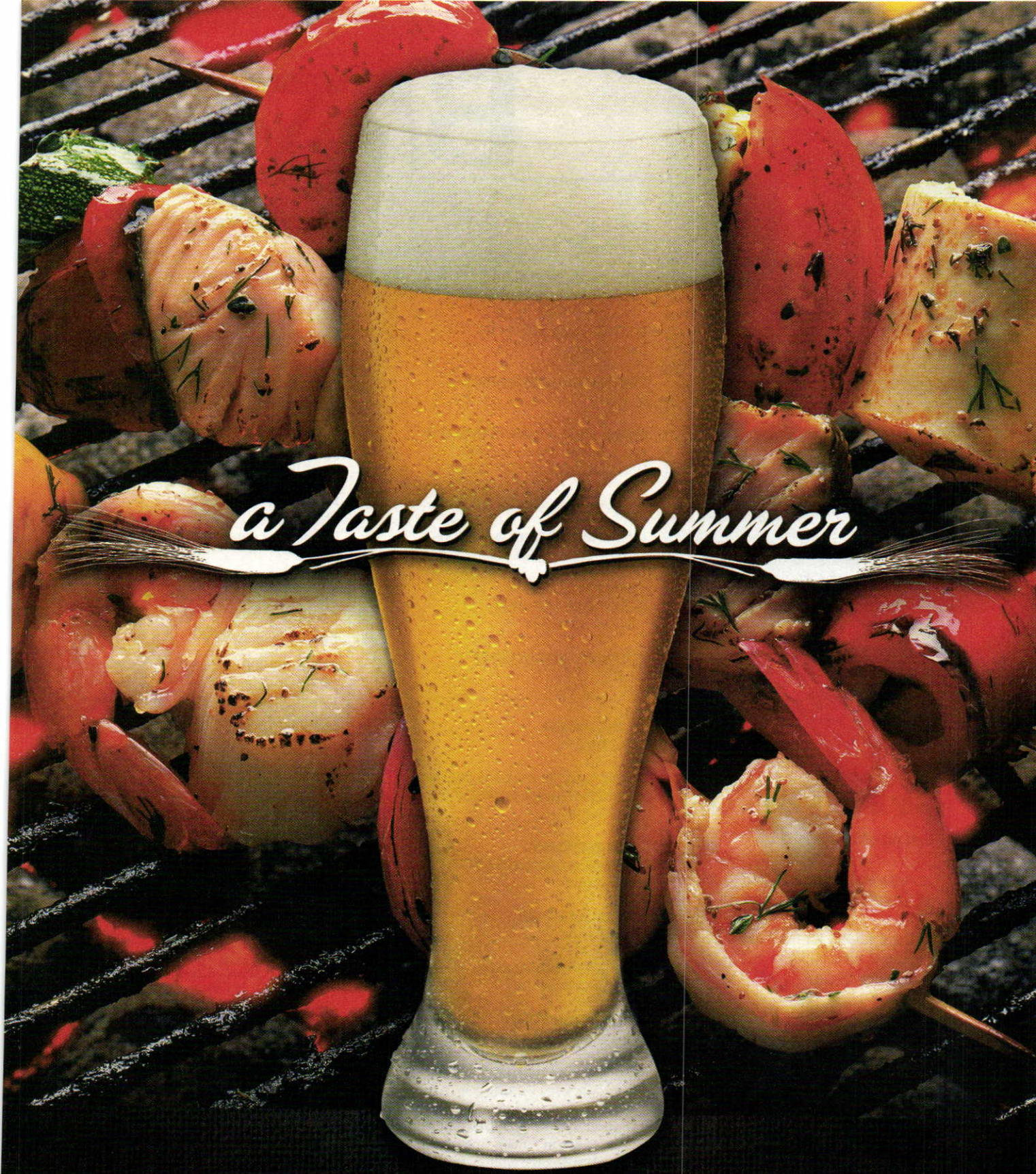
Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE

Departments

Features



Where to find it



SPRING'S OKAY. AUTUMN'S ALRIGHT.

BUT SUMMER GIVES YOU THE BEST OCCASIONS FOR BEER. WHETHER YOU'RE GRILLING OUT OR JUST HANGING OUT, GRAB YOUR FAVORITE LAGER OR ALE AND ENJOY THE BEST TIME OF THE YEAR. IT'S BEER SEASON.

FOR EVERYTHING ABOUT BEER AND MORE, GO TO HERESTOBEER.COM

HERE'S TO BEER

RESPONSIBILITY MATTERS ©2006 Here's to Beer, Inc. Washington, D.C.

RECIPE INDEX

BYO RECIPE STANDARDIZATION

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

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

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

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

Brew Your Own — THE HOW-TO HOMEBREW BEER MAGAZINE

EDITOR
Chris Colby

ART DIRECTOR
Coleen Jewett Heingartner

ASSISTANT EDITOR
Betsy Parks

TECHNICAL EDITOR
Ashton Lewis

CONTRIBUTING WRITERS
Steve Bader, Thom Cannell, Horst Dornbusch, Bill Pierce, Marc Martin, Terry Foster, Glenn BurnSilver, Kristin Grant, Paul Zocco

CONTRIBUTING ARTISTS
Shawn Turner, Jim Woodward

CONTRIBUTING PHOTOGRAPHER
Charles A. Parker

CANINE ASSISTANT
Heidi

PUBLISHER
Brad Ring

ASSOCIATE PUBLISHER & ADVERTISING DIRECTOR
Kiev Rattee

ADVERTISING SALES COORDINATOR
Dave Green

BOOKKEEPER
Jim Moulton

OFFICE MANAGER
Andrew Putney

NEWSSTAND DIRECTOR
Carl Kopf

EDITORIAL REVIEW BOARD
Matt Cole • Rocky River (Ohio) Brewing Co.
Horst Dornbusch • Beer Author
Mark Garetz • Homebrew Consultant
Chris Graham • Beer, Beer and More Beer
Craig Hartinger • Merchant du Vin
Anita Johnson • Great Fermentations (IN)
Marlon Lang • Homebrew Consultant
John Maier • Rogue Ales
Paul Manzo • Homebrew Consultant
Kirby Nelson • Capital Brewing Co.
Greg Noonan • Vermont Pub & Brewery
Ralph Olson • Hopunion USA Inc.
Mark Szamatulski • Maltose Express
Tess Szamatulski • Maltose Express
John Weerts • Homebrew Consultant
Chris White • White Labs
Anne Whyte • Vermont Homebrew Supply

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
Chris Colby
chris@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
Fax: (760) 738-4805

Special Subscription Offer
8 issues for $24.95

Web Site
www.byo.com

Brew Your Own (ISSN 1081-826X) is published monthly except February, April, June and August for $24.95 per year by Battenkill Communications, 5053 Main Street, Suite A, Manchester Center, VT 05255; tel: (802) 362-3981; fax: (802) 362-2377; e-mail: BYO@byo.com. Periodicals postage rate paid at Manchester Center, VT and additional mailing offices. Canada Post International Publications Mail Agreement No. 40025970. Return undeliverable Canadian addresses to Express Messenger International, P.O. Box 25058, London BC, Ontario, Canada N6C6A8. POSTMASTER: Send address changes to *Brew Your Own*, P.O. Box 469121, Escondido, CA 92046-9121. Customer Service: For subscription orders call 1-800-900-7594. For subscription inquiries or address changes, write *Brew Your Own*, P.O. Box 469121, Escondido, CA 92046-9121. Tel: (800) 900-7594. Fax: (760) 738-4805. Foreign and Canadian orders must be payable in U.S. dollars plus postage. The subscription rate to Canada and Mexico is $30; for all other countries the subscription rate is $40.

All contents of *Brew Your Own* are Copyright © 2007 by Battenkill Communications, unless otherwise noted. Brew Your Own is a registered trademark owned by Battenkill Communications, a Vermont corporation. Unsolicited manuscripts will not be returned, and no responsibility can be assumed for such material. All "Letters to the Editor" should be sent to the editor at the Vermont office address. All rights in letters sent to *Brew Your Own* will be treated as unconditionally assigned for publication and copyright purposes and subject to *Brew Your Own's* unrestricted right to edit. Although all reasonable attempts are made to ensure accuracy, the publisher does not assume any liability for errors or omissions anywhere in the publication.

All rights reserved. Reproduction in part or in whole without written permission is strictly prohibited. Printed in the United States of America.

Volume 13, Number 4: July-August 2007.

Cover Photo: Charles A. Parker

Terrific Tape

I really like the how-to articles in BYO. In the May-June 2007 issue, there was an article on making upgrades to plastic fermenters. I gathered the parts to put a ½" valve in my fermenter and drilled the hole. A little sanding with the Dremel and the fitting was in. I put the lock ring on and applied the Teflon tape and then the valve. It seemed like there would not be enough threads left for the valve, but I got it on. Since my fermenter did not come with gallon marks on the outside, I thought I would kill two birds with one stone and test the new valve. So I started to dump gallon jugs of water in and mark them. With the first gallon I noticed drops leaking from the fitting, so I dumped the water and started checking the fitting. No matter how tight I tried to get the fitting, it just would not seal. So to make a long story short, I ended up removing the lock ring and putting the ½" valve right up to the bucket wall with a few good wraps of Teflon tape and eureka! No leaks. Don't skimp on the tape to ensure a good seal. And I plan on disassembling this between each batch just to gain peace of mind, but the parts are very affordable anyway so replacement is a no brainer.

Lee Nagel
Southwest Missouri

Teflon tape is indeed a great remedy for almost any leaky fitting. However, for our plastic bucket conversion project, keep in mind that overtightening can lead to a leaky connection. The next time you take the spigot apart, try hand tightening the complete assembly and see if you can't get a good seal.

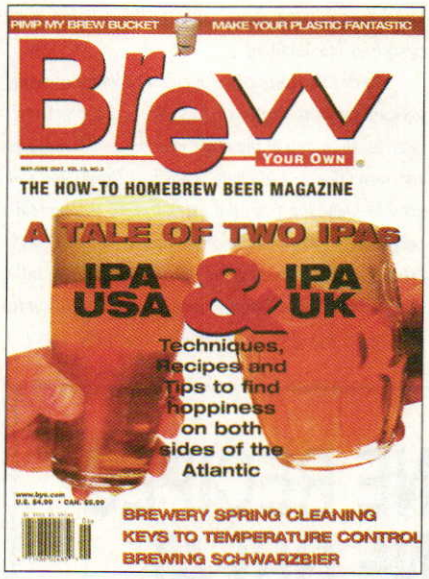
Street Elbow Needed

I was assembling the water filter ("Fast Water Filtration," January-February 2007) from the parts listed and realized that a mistake was entered in the article. The parts list listed a 2" 90 degree elbow as one of the parts. The correct part should have been a 2" 90 degree street elbow.

Greg Dotson
Lake Station, Indiana

Thanks for the clarification. Although the part pictured in the article is a street elbow, it is not labeled correctly in the parts list.

(For those readers wondering about the difference between these two types of elbows, in plumbing, an elbow has two female ends. A street elbow has a male and female end.)



Partial Mash Recipes

I have some questions regarding the "Countertop Partial Mashing" article from the October 2006 issue. I understand the basic process, however, I am struggling to determine how to take an extract recipe and turn it into a recipe that follows the article's process.

Jason Calkins
Colorado Springs, Colorado

Converting all-grain or extract homebrew recipes to a partial mash formulation is fairly straightforward. Although you asked about extract, we'll start will all-grain first. To convert an all-grain recipe to a partial mash recipe, start by taking all the specialty grains from the all-grain recipe and adding them (in the same amounts) to your partial mash recipe. Then, fill out your grain bill to the total mash size — in the case of a countertop partial mash, 4.0 lbs. (1.8 kg) — with the base grain. Next, add enough light dried malt extract to the ingredient list to yield roughly half the projected original gravity of the beer. (For example, if you are making a beer with a 1.048 original gravity, the wort from the partial mash plus the dried malt extract should yield 5 gallons (19 L) at SG 1.024.)

Complete the recipe by adding light liquid malt extract to supply the final one-half of the extract weight. The wort from the partial mash and dried malt extract get boiled on your stove. The liquid malt extract is added at or near the end of the boil. This process works for any all-grain recipe that contains less specialty grains than the partial mash size (for countertop partial mashing, less than 4.0 lbs./1.8 kg of specialty malts) and a single base malt.

James Spencer is the host of the Basic Brewing Radio and Basic Brewing Video podcasts, which can be found at www.basicbrewing.com. James started brewing in 1996 and in 1998, he won the only homebrew contest he ever entered — the 3rd Annual Ozark Homebrew Contest. Since that contest has not been held since, he's not only undefeated, but the reigning champ. On page 30 of this issue, James explains the benefits, tips and tricks to successful small-scale brewing.

Forrest Whitesides brewed his first batch of homebrew, an English brown ale, in the summer of 1995. These days, he brews Belgian ales of all kinds. Forrest is a graduate of North Carolina State University and lives in Hopatcong, New Jersey with his wife and two cats.

In most issues of BYO, Forrest writes the Projects column. In this issue, in a feature article beginning on page 44, he details the plans to build two different stir plates.

Jon Stika has been the author of BYO's Techniques column since the March-April 2007 issue. In the September 2006 issue of BYO, he wrote an article on how to preserve wort for yeast starters by pressure canning it.

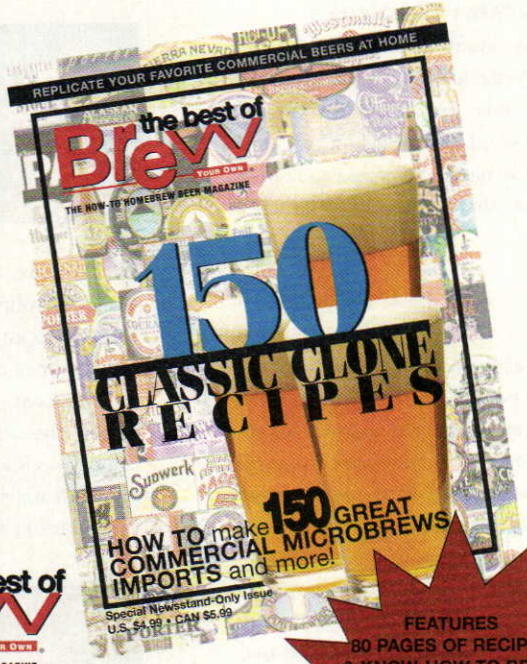
On page 51 of this issue, he returns to the topic with an article describing how to make a yeast starter — and how to keep the yeast in suspension, and enhance your yeast-growing ability, by employing a stir plate.

For extract recipes that use steeped specialty grains and light malt extract, the process is similar. Take the specialty grain portion and add base malt to round out your mash. The type of base malt you use will depend on the beer type. As a quick guide, use English 2-row pale malts or 2-row pale ale malts for English ales. Use German Pilsner malts for lager beers and American 2-row malts for American pale ales and IPAs.

Next, add enough light dried malt extract to reach the halfway point in terms of specific gravity and round out the recipe with the light liquid malt extract for late addition.

To do the calculations mentioned here, brewing software such as ProMash, BeerTools, StrangeBrew, BeerSmith or any of the other brewing software packages available is a big help. (Without these, you will need to know the potential extract of all the ingredients in your recipe.) Plan on getting around 60–65% extract efficiency from your partial mash — a little less than most all-grain brewers, but with only 4 lbs. (1.8 kg) of grain, it shouldn't be a big worry.

150 CLONE RECIPES IN ONE GREAT SPECIAL ISSUE!



the best of Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE
150 CLASSIC CLONE RECIPES

FEATURES
80 PAGES OF RECIPES
& KNOW-HOW TO BREW
150 COMMERCIAL
MICROBREW AND IMPORT
BEERS

Replicate your favorite commercial beers featuring the best clone recipes from the last ten years of BYO.
- Intro on how to clone brew commercial beers
- 150 recipes provided for all-grain and extract brewers
- Cross indexed so you can easily find your favorite recipes by brewery or style

At just $4.99 ($5.99 CAN) retail, you won't find a more valuable recipe collection to brew beers like the pros make!

This special newsstand only issue is available at better homebrew retailers or order today by calling 802-362-3981 also available online at brewyourownstore.com

* Attention homebrew supply shop owners - call us today at 802-362-3981 to discuss volume discounts to resell the BYO 150 Classic Clone Recipes issue in your shop

Pearls of Wisdom

In general, there is no whole but only pearled barley available to common mortals in my country. Whole wheat, though, is attainable. I understand that the amylase contained in malt is the substance that converts into sugar the starch contained in cereals; and that malt (and therefore amylase) can be attained from almost any cereal. I plan to make malt with whole wheat; grind pearled barley and treat it with the malted wheat, so as to convert into sugar the starch from the ground pearled barley.

Would you care to comment on the above plan?

Jorge A. Pardo
Caracas, Venezuela

If you can malt some wheat on your own, you could mash some pearled barley — perhaps up to 30%, depending on the enzymatic power of your homemade wheat malt — along with it.

Be aware, though, that the pearled barley (also called pearl barley) will contribute only extract to your wort, not any flavor. When you brew with malted barley (or malt extract made from malted barley), barley malt flavor is imparted to the wort from compounds in the husk. These compounds are formed during malting, when the malt is kilned (heated). Pearled barley is huskless. (In addition, its bran — the hard, outer aleurone and pericarp layers — have also been removed.) Also, it is not kilned or roasted.

As the gelatinization temperature of barley is less than that of corn or rice, you should be able to stir the pearled barley right into your mash without having to perform a cereal mash.

Brewing with Beechwood

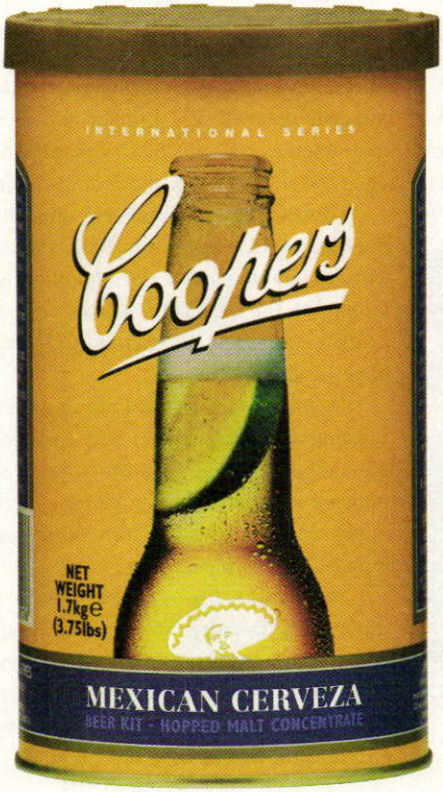
I have been brewing beer for about a year now and am ready to try and make a new flavor of beer. Do you know anywhere that I can buy beechwood chips to include in my brewing process?

Tracy Camp
via email

Adding beechwood chips to lagering tanks used to be a somewhat common brewing practice. These days, Anheuser-Busch is the only brewery we know of that does it. The chips don't add any flavor to beer, they just provide more surface area for the yeast to settle onto, which lets the beer clear and lager faster. When beechwood strips are used, they are generally steamed or boiled (perhaps with a little baking soda) to sanitize them and remove any traces of flavor.

Some BBQ shops carry beechwood among the types of wood they sell for smoking meats.

FAST, EASY, SIMPLY THE BEST.



Mix, Brew, Bottle...

Add a slice of lime and think "Cancun".

The Coopers Brewery International Series. Also available in Bavarian Lager, Canadian Blonde and Australian Pale Ale.

New to Beermaking?
Visit www.cascadiabrew.com
and sign up to receive your FREE
quarterly Coopers Club
Newsletter. Interesting stories,
recipes, product info.

Coopers

www.cascadiabrew.com

homebrew PROFILE

Mark Wright • Canton, Michigan

I call my passion for brewing, "Wright's House Of Folly Home Brewery." I've been a homebrewer since 1981 and started as an extract brewer, using a porcelain turkey roaster as my brew pot, an open plastic trash can as the primary fermenter covered with cloth, and a glass carboy as the secondary with a fermentation lock. I used this setup until 1990, when I upgraded to a 5-gallon (19-L) stainless steel brew pot, in which I still couldn't boil the entire wort, and had many wonderful boil overs (I still use this kettle for decoction mashes). Knowing what I know now, I'm amazed that I never had a contaminated batch, but that's the way most of us did it back then, and many still do.

Photo Courtesy of Mark Wright

Mark Wright with his self-designed (and built) brewing stand.

I bottled all my homebrew until I took the big step into kegging in 2002. I worked with a guy named Kevin Mueller who taught me the basics, then I went out and bought the gear (regulator, CO_2 tank, hoses and picnic tapper).

Kevin also introduced me to all-grain brewing. I was impressed and amazed at how simple it was. By Christmas I was brewing my first batch of all-grain. I then designed and built my own brew stand from black iron pipe.

My favorite brews are a blonde ale (my wife's favorite — see the recipe below), Irish red ale, bock, California common, Hefeweizen, pale ale and sometimes something different (farmhouse ale & hazelnut brown ale were my latest).

byo.com BREW POLL

What is your favorite homebrew to make for summer?

Pale Ale 32%
Hefeweizen 31%
American Wheat 11%
Kölsch 9%
English Bitter 8%
Pilsner 8%

Check out the latest poll question and vote today at byo.com

Homebrew CALENDAR

July 14
E.T. Barnette Homebrew Competition
Fox, Alaska
Named for the founder of what is now Fairbanks, Alaska, the E.T. is a BJCP sanctioned competition. Entries accepted from June 25 until 5 p.m. July 11. Best of show receives $500. For entry information and forms, visit www.mosquitobytes.com/Den/Beer/Events/Events.html.

July 21
Lunar Rendezbrew
Seabrook, Texas
Houston's biggest homebrew party featuring a homebrew competition, homemade soda competition for kids, live music, and plenty of games (corney o-ring contest anyone?) Visit www.mashtronauts.com/lr/lr.html for more information.

August 18
Beer and Sweat 2007
Cincinnati, Ohio
The Nation's first and only keg-only homebrew competition. Features a competition followed by live music, a party and plenty of tasting. More information at www.bloatarian.org

reader RECIPE

Mark Wright

Judy's Blonde Ale

OG = 1.056 FG = 1.014
IBU = 25.7 SRM = 3.9 ABV = 5.56
(Based on 75% efficiency and 75% attenuation)

Ingredients

6.5 lbs. (3 kg) American two-row (Briess brewers malt)
1.5 lbs. (0.7 kg) flaked corn (maize)
1.5 lbs. (0.7 kg) Munich malt
1.0 lb. (.45 kg) flaked rice
8 oz. (.23 kg) American crystal 10 °L
6.6 AAU Saaz hops (bittering) (2.2 oz./62 g of 3% alpha acids)
3.42 AAU Hallertauer hops (finishing) (0.9 oz./26 g of 3.8% alpha acids)
1 tsp. Irish moss
White Labs WLP001 (California Ale) yeast
5 oz. (0.14 kg) corn sugar (for priming)

Step by Step

Infuse grains and adjuncts (corn and rice) into 3.45 gallons (13 L) of 165 °F (74 °C) water for a rest temperature of 149 °F (65 °C) for 60 minutes. Then add direct heat until mash reaches 155 °F (68 °C) and rest for 30 minutes. Raise to 168 °F (76 °C) for 10 minutes (mashout temp.), then re-circulate for 15–20 minutes until it runs clear. Fly sparge with 4.75 gallons (18 L) of water at 170 °F (77 °C) for approximately 45-60 minutes (very slowly) to collect 6.9 gallons (26 L) of wort. Bring wort to a boil, add bittering hops and boil for 60 minutes. Add finishing hops and Irish moss 45 minutes into boil (15 minutes left). Chill, aerate well and pitch yeast. Prime with 5 oz. corn sugar for a CO_2 target volume of 2.6 or pressurize corny keg to 13.4 PSI to serve at 40 °F (4 °C).

homebrew systems that make you DROOL

Jeff August • North Branch, Minnesota

I am a relatively new brewer (my first brew was February 2006) that started with some assistance from my military buddies from the Air National Guard. Since then, I've been hooked. But there was a problem — how to keep more than one brew on tap at a time?

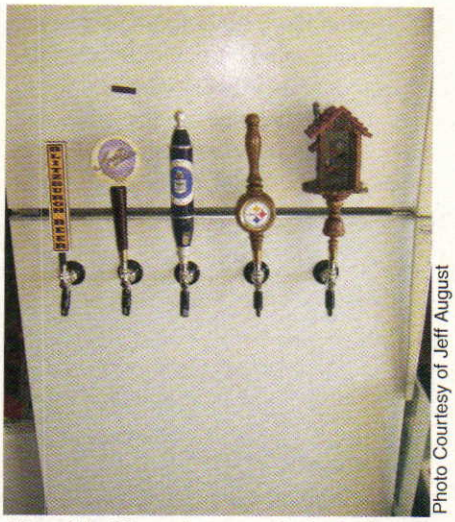
I started my 5-tap fridge by purchasing a used 28-cubic-foot fridge from the Internet. Since I brewed more than three styles of beer, I needed several taps. I spoke with the guys at my local supplier for help and drafted a plan.

I constructed a Cornelius gauge that had three low-pressure gauges and one high-pressure gauge. From two of the low-pressure gauges, I installed a 2-line manifold system. I custom built the gauge so I could deliver three different pressures to suit the individual styles of beer.

I removed the inner parts of the fridge and created a plywood platform that could hold five corny kegs and one 20-pound CO_2 tank.

Once it was all put together, the fridge had her maiden tapping in November 2006. The kegs were filled with beer and forced carbonated for three days at 30 pounds of pressure. I had a group of friends over for beer that day and they were completely amazed.

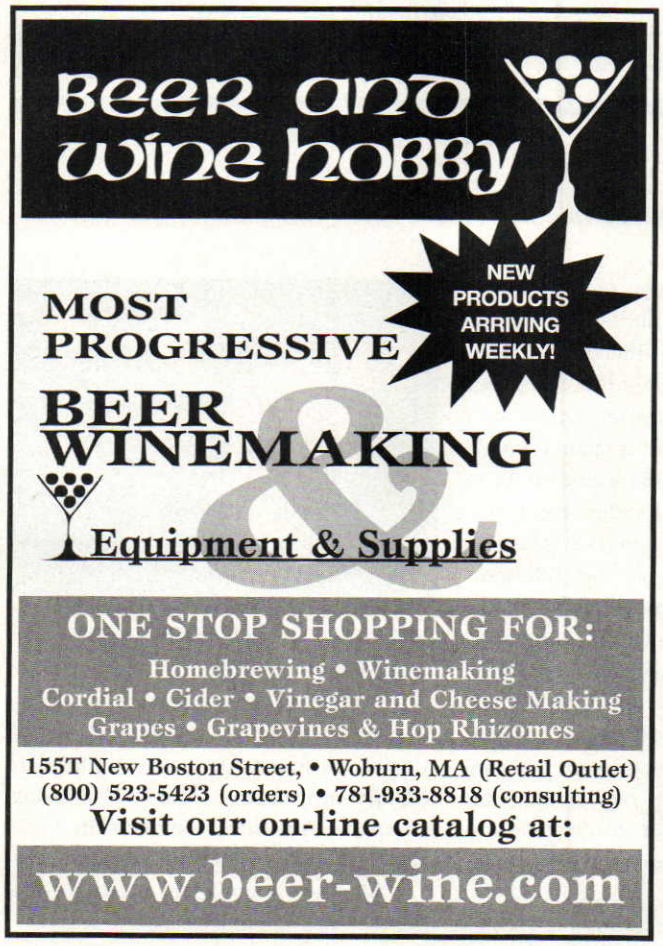
The inner workings of Jeff's 5-tap beer fridge includes custom-built gauges.



It's not just homebrew on draft. Jeff's kids brew a mean rootbeer as well!

Photo Courtesy of Jeff August

Currently I have Irish red, hefeweizen, Fat Tire (clone), honey weiss, and a rootbeer on tap. My kids actually brew most of the root beer, which makes me hope that someday they will become homebrewers, like their dad.



reader PROJECT: BREW STAND

Ron Doczkat • Monroeville, Pennsylvania

I live in the Northeast. It's cold seven months of the year, but despite that, outdoors is where I like to be. I like to crank up the blues on the stereo and brew beer on the patio. But the work of lugging the propane tank, burner, and everything else that goes along with it was becoming a little tedious. My wife and I were also looking for some furniture to use on our new patio. So I came up with a way to keep some of the brewing equipment on the patio and make it useful when I'm not brewing. Since, in my opinion, women are thermally challenged, I thought if I could incorporate heat into the patio furniture my wife wouldn't object to creating the new furniture from brew gear.

This is what I came up with: A trip to the local scrap yard provided me with all the materials I needed and I MIG-welded it together. To hold the propane tank and burner, I welded a support and the kettle I use for brewing fits on top of the stand.

Photos Courtesy of Ron Doczkat

Ron Doczkat's homemade patio table has more than just good looks and a source of heat for cool nights. It doubles as a brewing stand.

Next, I purchased a 36" round tabletop and cut an 8" hole in it to dissipate the heat. I used stainless steel mesh as a chimney and used an 8" steel plate on top. The kettle and the tabletop are interchangeable. We have used the table on cool nights enjoying fine homebrew and piping hot pizza from atop the chimney cap/food warmer. Safety note: No small children live in our home or visit. Otherwise we would use caution as the chimney gets very hot.

BEER and FOOD summer RECIPE

Malty Spice Rub

1 Tb. powdered dark barley malt
2 Tbs. dark brown sugar
2 Tbs. hot paprika
1 Tb. ground ancho chile
1 Tb. onion powder
2 tsps. cumin
2 Tbs. kosher salt
1 tsp. ground allspice
2 Tbs. brown mustard seeds
1-2 Tbs. cracked black pepper

Directions: Mix all ingredients well and use as a rub for beef or pork.

Makes just over ¼ cup.

Excerpt from *Grilling with Beer* by Lucy Saunders. Expanding on the subject of her 1996 book *Cooking with Beer*, Saunders gives a fun and comprehensive guide to anyone who loves grilling as much as they love beer.

club PROFILE

The Green Bay Rackers • Green Bay, Wisconsin

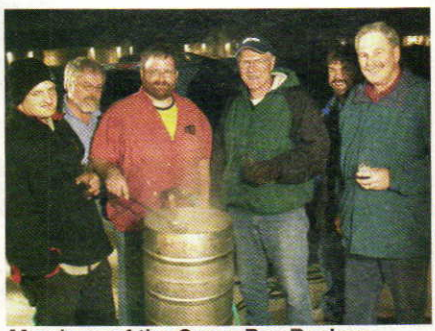
The Rackers initially formed in 1982 in Green Bay as The Grain Exchange to share information, equipment and scarcely available brewing supplies. The club was founded by members of LifeTools Co-op, a homebrew supply and adventure outfitting store and some of its customers.

The Grain Exchange initially met at the local musician's union hall, because many of its founding members were also members of the musician's union. Meetings typically included demonstrations or discussions on specific brewing topics and tasting homebrews or rarely available craft or import beers.

In the early 1990's, the club changed its name to The Green Bay Rackers. Under the leadership of then president Bert Zelten, we designed a logo and organized our first competition in 1995, which was a single-style contest, open only to members. Fourteen members entered American-style pale ales that were judged by Mike Conard, the only BJCP program judge in northeast Wisconsin at the time.

The contest became an annual event and expanded in 1997 to include all BJCP styles (excluding mead, cider, and sake) and became an open BJCP/AHA sanctioned contest known as the Titletown Open Homebrew Competition, named for the Titletown Brewing Company.

In 1998, the club experienced rapidly-expanding membership and significant improvement in the members' brewing skills. We even started conducted brewing experiments, including one to demonstrate the flavor variability of a single common recipe on 30 different brewing systems. Recently, we purchased a used bourbon barrel and are attempting to concoct a barrel-aged beer.



Chuck Golueke

Members of the Green Bay Rackers gather around a batch of homebrew.

These days, we meet once a month at a member's home, at the House of Homebrew (our source for supplies and equipment) or the Titletown Brewing Company. The club's membership also now includes home winemakers.

For more information, check out the Rackers Web site at www.rackers.org.

replicator

by **Marc Martin**

Dear Replicator,

I am an avid homebrewer from the Pacific Northwest and have had only one opportunity to enjoy Shelter Pale Ale from the Dogfish Head Brewery in Milton, Delaware. While visiting my family in Washington D.C. last summer, I was able to convince them that dinner in their Gaithersburg alehouse would be worthwhile. It was, and now there are six more fans of "off-centered ales (and food) for off-centered people." The problem is, I can't find Shelter Pale Ale anywhere in Portland, Oregon or Vancouver, Washington. Several other Dogfish Head beers are available, but not this one. I work at a homebrew supply store and would really like to be able to brew this fine beer. Would it be possible for you to get an all-grain recipe of it for me ?

Ken Winkley
Vancouver, Washington

My call to the Dogfish Head brewery was eagerly answered by brewmaster Andy Tveekrem. He was very happy to hear of the interest in their beers from a homebrewer who lives in the Northwest beer mecca.

Andy has been a brewmaster at Dogfish Head for three years and loves working in an "off-centered" brewery. He attended the Siebel Institute for his formal brewing education but started, like you, as a homebrewer in 1986. Prior to becoming a brewmaster at Dogfish Head, he was a brewer at Great Lakes Brewing and Frederick Brewing.

Andy reports that Shelter Pale Ale is the original beer of the brewery when Dogfish Head opened in 1995 in Rehoboth Beach, Delaware. It is also one of their most popular. Even now that they operate from three locations around Delaware and Maryland, beers like their 60-, 90- and 120-Minute IPAs gain all the notoriety — and therefore the distribution — to the West Coast.

Andy describes Shelter as a more robust pale ale, but one that still makes a great session beer. Andy believes that a simple, straightforward malt bill produces the best pales ales. It has a good malt backbone with Glacier and Warrior hops providing a solid hop presence. The use of an English "Ringwood" strain of yeast gives this beer a slight nuttiness and allows it to finish medium dry. All in all, a great summer beer that pairs well with grilled burgers and barbeque.

Due to it's popularity in the central Atlantic states, Shelter Pale Ale will probably never make it to the Pacific Northwest. Now, thanks to the fine folks at Dogfish Head, you can "brew your own."

For further information about the Dogfish Head Brewery in Milton, Delaware, the Rehoboth Beach brewpub (where they brew all the experimental styles) or the DFH Alehouse in Gaithersburg, Maryland, visit their Web site: www.dogfish.com or call the main brewery at 302-684-1000.

Dogfish Head Brewing Co. Shelter Pale Ale

(5 gallons/ 19 L, extract with grain)

OG = 1.052 FG = 1.013
IBU = 30 SRM = 9 ABV = 5.0 %

Ingredients

6.6 lbs. (3.0 kg) Briess light, unhopped, malt extract
7.0 oz. (198 g) light dried malt extract
6.0 oz. (170 g) crystal malt (120 °L)
2.0 oz. (57 g) amber malt (35 °L) (substitute dark Munich or carastan if needed)
½ tsp. Irish moss (15 min.)
8 AAU Warrior hops (60 min.) (0.5 oz./ 14 g of 16% alpha acid)
2.75 AAU Glacier hops (10 min.) (0.5 oz./ 14 g of 5.5% alpha acid)
6.5 AAU Simcoe hops (0 min.) (0.5 oz./ 14 g of 13% alpha acid)
White Labs WLP 005 (British Ale) or Wyeast 1187 (Ringwood Ale) yeast
0.75 cup (150g) corn sugar (for priming)

Step by Step

Steep the crushed grain in 1 gallon (3.8 L) of water at 155 °F (68 °C) for 30 minutes. Remove grains from the wort and rinse with 1 quart (0.9 L) of hot water. Add 1.5 gallons (5.7 L) of water plus the liquid and dry malt extracts and bring to a boil. While boiling, add the hops as per the hopping schedule. Add the yeast nutrient and Irish moss after 45 minutes of boiling. Now add the wort to two gallons (7.6 L) of cold water in the sanitized fermenter and top off with cold water up to five gallons (19 L).

Cool the wort to 75 °F (24 °C). Pitch your yeast and aerate the wort heavily. Allow the beer to cool to 68 °F (20 °C). Hold at that temperature until fermentation is complete. Transfer to a carboy, avoiding any splashing to prevent aerating the beer. Let the beer condition for one week and then bottle or keg. Allow to carbonate and condition for two additional weeks and enjoy your Shelter Pale Ale.

All-grain option:

This is a single step infusion mash. Replace the liquid malt extract and dried extract with 10.75 lbs. (4.9 kg) 2-row pale malt grain. The specialty grains remain the same. Mix the crushed grain with 4.5 gallons (17 L) of 172 °F (78 °C) water to stabilize at 155 °F (68 °C) for 60 minutes. Sparge slowly with 175 °F (79 °C) water. Collect approximately 6.0 gallons (23 L) of wort runoff to boil for 60 minutes. Reduce the bittering hop amount to 0.4 oz. (11 g) to allow for the higher utilization factor of a full wort boil. The remaining instructions for this recipe are the same as the extract with grain recipe.

Keep it fresh

Storing brewing ingredients

by Betsy Parks

For beginning brewers, the key to success is avoiding common mistakes like contamination and poor sanitation. Proper storage of brewing ingredients, however, is often overlooked. Grains, extracts, yeasts and hops all have limited shelf lives and need particular storage conditions. Yet even seasoned pros sometimes let a yeast stick around for too long, or leave some hops exposed to the air. Diligence in storing your ingredients will not only eliminate places to point the finger if a brew goes wrong, it also fosters good brewing habits for the future.

Grains

Like most foods, brewing grains and malts don't last forever. If kept in cool, dry conditions in a sealed environment such as a large Tupperware-type container that seals away air (and pests), whole grains like barley, wheat and oats can be kept at room temperature for up to a year. Crushed grains have a shorter shelf life and can go stale in a matter of weeks if exposed to air. Try to buy close to the amount you need for each session if you don't plan to brew regularly and this won't be an issue. If you must store, however, portion the grain into sealed containers or zippered plastic bags in useful-sized quantities such as five or ten pounds. Keep them in the temperature range of 50-70 °F (10-21 °C) in a dry place and they can last for a few months.

Extracts & malt syrups

Like grains, extracts and malt syrups need to be kept in sealed containers away from air and moisture. Keep dry malt extracts in these conditions at 50-70 °F (10-21 °C) and they can last several years. Malt syrup in unopened cans can last more than a year at room temperature. When stored at room or warmer temperatures, repackaged or opened containers of liquid malt extract may mold. Prolonged storage of liquid malt extract, especially at warm temperatures, causes darkening and changes in the flavor. This is especially true in light colored malt extracts. Malt extracts made from specialty malts have longer shelf lives.

Hops

Care in storing hops is especially important because the aromatic qualities coveted by brewers are susceptible to heat, age and oxygen. Alpha acids also deteriorate with time, and some hop varieties have better storage properties than others. Most homebrewers purchase pellets or kiln-dried varieties which were likely stored at temperatures of 20 to 30 °F (-7 to -1 °C). Therefore, it's OK to store your hops in the freezer. Because they are kiln-dried, they are not susceptible to freezer burn because of their low moisture. Seal your hops tightly against any air exposure, however, as your freezer is probably cooling more than hops. Exposed hops can absorb the nasty odors lurking in your freezer and later pass them on to your beer. Seal them in a zippered freezer bag with the extra air pushed (or sucked) out. Under cool, oxygen-free conditions, hops can last for two or three years, although storage life depends on the variety.

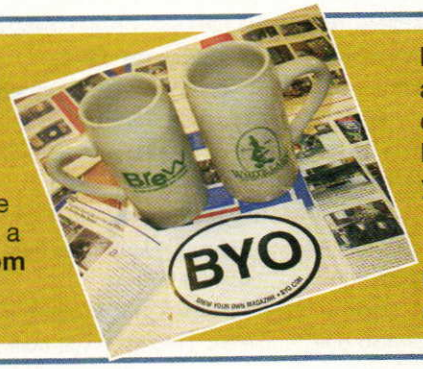
Yeast

All yeasts like to be stored in cool environments like the refrigerator. Dry yeast that has not been hydrated in water can last up to a year, or the manufacturer's expiration date, in temperatures between 40 and 45 °F (4 to 7 °C) if left unopened in its package. Liquid yeasts, which come in packs or vials that activate when you squeeze or "smack" a plastic bubble of yeast inside the bag which mixes it with malt extract, can also be stored in certain conditions. Wyeast recommends that liquid yeasts be stored at a constant temperature between 32 and 40 °F (1 and 4 °C), preferably in a part of the refrigerator without temperature fluctuations — such as the meat drawer. Storage time must be minimized. Most seasoned brewers shy away from using smack packs stored for more than a week to ten days, and once the pack is 'smacked', liquid yeasts are similarly perishable and shouldn't be stored for more than a week or so unless you plan to make a yeast starter (see more on making a starter on page 51).

Finally, proper storage means nothing unless you know how long it's been there. Always label and date everything!

we want you

Do you have a system or a homemade gadget that will make our readers drool? How about a killer recipe or tip? Want to profile your club? Email a description and photos to **edit@byo.com** and experience fame among 100,000+ homebrewers!



If we publish your article, recipe, photos, club news or tip in Homebrew Nation, you'll get a cool ½ Liter German Stein (courtesy of White Labs) and a *BYO* Euro sticker.

Summer Beers

What to brew when the heat is on

by Betsy Parks

There's nothing more synonymous with summer than a tasty seasonal brew. It's the beverage you enjoy at the beach, after mowing the lawn, at a barbecue or just because it's hot. This issue, we asked two professional brewers responsible for a few of our favorite summer brews how to capture the essence of the season in a beer and what advice they have for making a summer recipe.

Bill Covaleski, brewmaster, founder and president of the Victory Brewing Company in Downington, Pennsylvania knows a thing or two about brewing a summer beer. Since he and his childhood friend Ron Barchet opened the brewery in 1996, some impressive brews have emerged from the Victory fermenters including seasonal brews like Sunrise Weissbier (a Bavarian hefeweizen) and Whirlwind Wit. Bill started brewing in the late 1980's and later studied brewing at the Doemens Institute in Grafeling, Germany. Before opening Victory, Ron worked as the head brewer at the Baltimore Brewing Company in Baltimore, Maryland.

My overall goal for making a summer beer is refreshment. This requires clean and well-defined flavors over murky complexity and low to medium body. Color has a lot of psychological impact, and lighter colored beers are favored in the summer as they tend to convey a sense of refreshment. Warm summer weather also requires beers that are lower in body so that they can serve as refreshers — often in volume — which means alcohol levels also need to be dialed back.

The process of creating a refreshing summer beer begins with ingredient selection, of course, and moves along into methods. For example, our Whirlwind Witbier is mashed for a bigger, grainy mouthfeel as we try and pull more proteins from the wheat and barley malt grist. In this way we can create a refreshing ale that offers citric snap up front, and a fleeting, evaporative finish but with a more substantial middle to satisfy us demanding craft beer lovers.

Tradition plays a role in creating a summer beer, as well. Long before we had the comforts of reliable heat and air conditioning, brewers were creating comfort in our drinks. So, the problem of weather extremes has been one that brewers have been addressing for centuries — so there is no reason to throw that knowledge away now. At Victory, we have avoided any gratuitous, heavy-handed twists to traditional recipes. We only seek to improve in areas where we feel there will be rewards gained. Prima Pils is a perfect example of this. Yes, it reaches higher IBUs than traditional European Pilsners would aspire to, but in selecting whole flower hops there are significant gains in both hop flavor and aroma made. Therefore, we have not just delivered more bitterness, we have wrapped that quenching dryness in the beauty of more pleasing aroma and more juicy hop flavor. We felt that is how a traditional beer with summertime appeal could be improved upon.

Ron Barchet (left) and Bill Covaleski (right), founders of the Victory Brewing Company in Downington, Pennsylvania.

As for ingredients, our best summer beers stick to noble hops to deliver the more integrated flavors of fresh grass and herbal spice that we feel are more appropriate for summer over the citrus, pine and grapefruit of some well-known American hops. Yeast is another story, and I would advise researching the style requirements well and rely on the practical advice of your fellow homebrewers or local professionals to make the right selection for the perfect summer brew.

Though we have yet to use them commercially in any of our brews, I have made ales that incorporate grains of paradise for spectacularly refreshing results. However, not to ignore the obvious, wheat malt can find its way successfully into most summer brews either in a leading role or as a supporting player.

If you're thinking about making a summer beer, my advice is to quantify the flavors that you want the beer to deliver and be specific and narrow to start rather than trying to accomplish too many flavors at once. This may be a learning process rather than a bold-stroke success. Keep in mind that balance and nuance are more refreshing than a lingering, tip-of-the-tongue complexity.

If your soul searching tells you that you want a fruit-accented beer, follow that lead with proper malt and yeast selection. If your senses tell you dryness, focus in on the malt, mashing and hopping. Maybe after successfully accomplishing both brews, you sense a middle ground that you might want to approach.

Todd Charbonneau, Head Brewer at Harpoon Brewery in Boston, Massachusetts and Windsor, Vermont has been with the brewery since 1998. and serving as the Head Brewer at their Boston brewery since 2001. That same year, he attended The Master Brewers Association Of The Americas short course in Malting and Brewing Science. Harpoon satisfies many a summer beer drinker with styles like their Kölsch-style Summer Beer.

For summer beers, I look for a light to medium body with a crisp, refreshing character and a fairly dry finish. I think consumers feel very strongly about beer color, especially for these types of beers, so a golden or straw color is most appropriate.

We employ a low mashing temperature with no dark, dextrinous specialty malts to make the perfect summer beer that has a crisp, dry malt character. The limited use of those darker malts will keep the color of your beer light. A low (150 °F/ 66 °C) mash temperature will give the beer a light body and texture through a complete fermentation. Your yeast selection will play a role in this, whether it is fruity and estery, or a clean lager strain. Remember that a complete fermentation with a low finishing gravity will result in a drier, more refreshing character and finish. Also, look for highly attenuative yeast strains.

For hops, steer clear of over-bittering a summer beer. Ample bitterness can be achieved without going into the puckering, cloying bitterness category. It's great to brew an IPA for the summer, but design it with drinkability in mind.

If you are looking for inspiration for a recipe, there are many styles that are refreshing and light in nature that brewers have taken to brewing for the summer months. American wheats, Pilsners and fruit beers are just a few examples that are used successfully by brewers all over the country. For our summer beer at Harpoon, we took a traditional German style, Kölsch, which is traditionally associated with lager characteristics but brewed with an ale yeast, and put our signature influence into it. We use our own ale yeast strain, which lends a fruity character and develops some nice, estery notes, which mingle well with the American-grown German varietal hops that we use. The finished beer is a light-bodied brew with a crisp, dry finish and a straw-golden color.

My advice is, as with any new brew, to keep it simple when you're starting out. Consider drinkability when you're designing the recipe and keep the body and color light. If you do that, and keep the bitterness moderate, the beer will be approachable and refreshing.

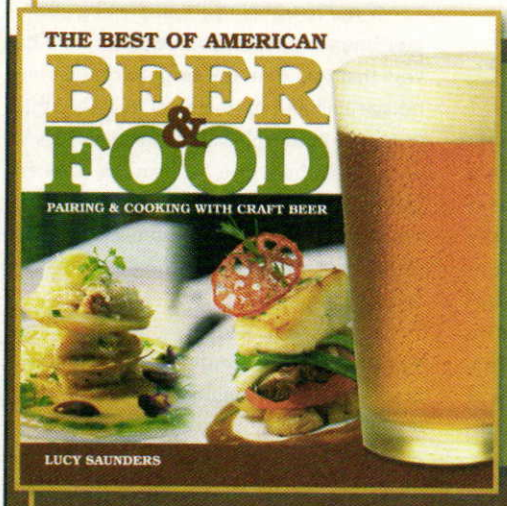
INTRODUCING

THE BEST OF AMERICAN

BEER & FOOD

PAIRING AND COOKING WITH CRAFT BEER

BY LUCY SAUNDERS



The Best of American Beer and Food showcases chefs and craft brewers who cook with beer and pair flavorful beers from pilsner to porter with hand-crafted foods. It begins by exploring the art of pairing flavorful beers with specific foods, then turns to recipes that incorporate beer, using the various flavors available from today's ales and lagers as food flavor components.

180 pages, 30 color illustrations, 75 recipes. Retail Price: $22.95

FULL OF IDEAS!

A MUST-HAVE FOR EVERYONE WHO LOVES CRAFT BEER.

SPECIAL OFFER

to AHA and BA Members Only!

$16 plus shipping and handling

For a limited time only.

Offer ends August 1, 2007.

Available August 2007

Reserve your copy today! Call 1.888.822.6273 or visit www.beertown.org.

Brewers Publications
A Division of the Brewers Association
www.beertown.org

Is a Keg Like a Can?

Controlling foam and the facts about water

"Help Me, Mr. Wizard"

by Ashton Lewis

Trouble with tyramine

There are certain medications that put restrictions on tapped beer because of a potentially bad reaction with tyramine. I've read that bottled and canned beer is OK but tapped (kegged) beer is something to watch out for. Correct me if I am wrong, but beer in the keg is the same as beer in a can or bottle (at least from a homebrew standpoint), right? I have seen breweries fill a keg from the same tank they bottle it from - so what gives? I am not a chemist or a doctor, nor do I play one on TV, but I am wondering if Mr. Wizard has any info on this.

Chris Love
San Jose, California

I have answered many questions over the years that deal with medical and health topics. The way I go about answering these questions is reading what I can find about these topics and then reporting what I have read. I always encourage readers to use my answers as background information that may be used to learn more about medical and health issues. Consulting with your family physician is always a good place to start. With that said, I do have some information on tyramine and beer that is interesting.

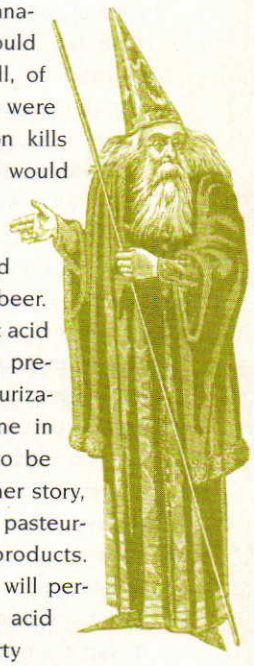
Tyramine is part of a group of compounds called biogenic amines and is formed when the amino acid tyrosine is decarboxylated. A more familiar biogenic amine is histamine, which is formed when histidine is decarboxylated. Although histamine is most commonly associated with scombroid fish (tuna, jack, blue fish and mackerel, for example) and is not found in beer, its formation is similar to that of tyramine. Tyramine and histamine are formed when certain bacteria metabolize the amino acids tyrosine and histidine. As histamine and scombroid poisoning is associated with the improper storage of fish species rich in histidine, tyramine in beer is primarily associated with the growth of lactic acid bacteria.

Tyramine increases blood pressure if not metabolized by the human body when consumed. Most people do not have a problem consuming foods containing tyramine. However, if you happen to be on a class of drugs called monoamine oxidase inhibitors (MAOI), things are different. MAOI are used to treat depression and anxiety. They also interfere with enzymes called monoamine oxidases that catalyze the oxidation of monoamines. When a person taking a MAOI consumes foods containing tyramine they are at risk of having severe increases in blood pressure that may result in stroke. Clearly this is not a topic to consider lightly.

I want to pause here and cite a few studies. The first paper published on this topic appears to be have been published in 1986 by BJ McCabe in the Journal of the American Dietetic Organization titled, "Dietary tyramine and other pressor amines in MAOI regimens: a review." McCabe's paper published a list of foods known to contain tyramine and among them was beer. Other foods known to contain tyramine include aged sausages, sauerkraut, aged cheeses, soy sauce and yeast and yeast extracts, for example marmite. The common trait of all of these food products is the presence, or potential presence, of bacteria that decarboxylate tyrosine. In fact, most of these food products rely on lactic acid bacteria to develop their characteristic flavors. Lactic acid bacteria are no strangers to beer and accordingly some beers test positive for high levels of tyramine. Six milligrams of tyramine is sufficient to elicit a mild reaction in people taking MAOI and 10-25 milligrams can cause a severe reaction.

SA Tailor, et al. published a paper in 1994 entitled, "Hypertensive episode associated with phenelzine and tap beer—a reanalysis of the role of pressor amines in beer." Tailor's group analyzed 98 beer samples, 49 packaged and 49 draught samples, and found 4 samples of draught lager that contained tyramine. They concluded from their survey that beer packaged in a bottle or can is acceptable to consume by those taking MAOI, but draught beer should be avoided.

This is where Mr. Wizard has no problem presenting some informed arguments related to this conclusion. If I were to guess the type of beers used in their survey (I have not been able to determine what beers they analyzed for tyramine), I would guess that most, if not all, of the packaged samples were pasteurized. Pasteurization kills spoilage organisms and I would not expect to find significant levels of compounds associated with lactic acid bacteria in pasteurized beer. Even if some level of lactic acid bacteria contamination is present in beer before pasteurization, the level of tyramine in packaged beer is likely to be low. Draught beer is another story, as most breweries do not pasteurize their draught products. Extended storage of kegs will permit more time for lactic acid bacteria to grow. Also, dirty draft lines can be a veritable breeding ground for spoilage organisms, including lactic acid bacteria. If a broader sample of bottled beer was included in the survey I am sure their conclusions would have been very different.



The bottom line is that any type of beer may have elevated levels of tyramine if lactic acid bacteria grow and decarboxylate tyrosine. Many Web sites giving dietary advice to people taking MAOI state that draught beer is off-limits, but bottled and canned beer is acceptable and most of this advice can be traced to conclusions drawn by Tailor's group. I think this advice should be taken with a grain of salt.

The brewing literature also has references to tyramine in beer and many of these papers cite sour beers, for example lambics, as a beer category known to contain tyramine. It's the beer that is critical to this discussion, not the package. Lambic is not a style I consider when thinking of draught beer, but I would bet a

lot of dough on finding tyramine in bottled lambic. This is an obvious contradiction to the blanket conclusion drawn by Tailor's group. Similarly, if you have some nasty bottle of contaminated lager you might have a problem.

I think that advice related to food and drug interactions is very conservative by nature. However, you can also be smart about the decision. If you are drinking clean beer, pasteurized or not, the likelihood of consuming tyramine is probably quite low. Still, the most conservative approach is recognizing and accepting that all unpasteurized beer is a possible source of tyramine.

Unfortunately, this advice excludes almost all homebrewed and craft brewed beer. If you know someone taking MAOI that really wants to drink unpasteurized beer and is certain enough that the beer is OK to drink, I strongly suggest that they discuss their understanding of this topic with their physician beforehand to avoid serious problems. I would also suggest better understanding why yeast and yeast extract is on the list of foods to avoid. Very yeasty unfiltered beers may also be a category to consume with caution. Of course another option is to discuss taking a different anti-depression drug with fewer dietary restrictions.

Fighting the foam

I am currently a graduate student studying materials science (polymer focus) and a teaching assistant for a professor who is considered an expert on the subject of silicones. Recently he informed our students that some form of silicon is used in the brewing of beer to reduce the amount of foam. I'm assuming this is referring to the fermentation process, but I may be wrong. I see the scientific reasoning behind this idea but my question is are there commercial brewers or homebrewers who actually use silicon during any part of their brewing? And if so, how and what type of effects could this have on the flavor and body of the final product, if any?

Michael Starr
Cincinnati, Ohio

The professor you are working for is correct to state that some brewers use anti-foams and it is also true that these compounds are silicon-based. Dimethylpolysiloxane, in the form of a water-based emulsion, is one type of anti-foam sold commercially.

The reasons that brewers would want to reduce foaming are pretty simple to understand. Foaming during wort boiling is one of the contributors affecting hop utilization. When foaming is reduced in the kettle, hop utilization tends to increase. This is because iso-alpha acids and alpha acids partition into foam, and when the foam sticks high on the kettle wall there is a loss of these compounds. Also, foaming during boiling can be dangerous if a kettle over-boils. Anti-foams used in the brewhouse are typically added as the kettle is heated so that the anti-foam mixes with the beer, and they work by decreasing wort surface tension.

A more common application of anti-foams is during fermentation. Foaming during fermentation is an expensive phenomenon and commercial brewers regularly use fermentation vessels with considerable headspace above the beer level to accommodate foam. One way to brew more beer is to fill the fermenters to a higher level. If this is done without the aid of anti-foam, the fermenter will blow foam and beer from the top of the tank. This makes a mess and results in beer loss. Add a little anti-foam, usually around one milliliter of anti-foam per 20 liters of beer, and this problem largely goes away.

Foam reduction during fermentation does more than simply allowing the fermenter to be filled to a higher level without causing a messy blow over. Hop utilization is increased, the loss of foam-positive proteins is reduced and the loss of trub to surfaces is decreased. Because of these factors, if anti-foams are used, the brewer will probably want to decrease the hopping rate to balance the increase in utilization that is expected.

The reported reduction in foam-positive proteins is exciting for foam lovers. Contrary to what one may assume about using anti-foams, they are known to actually improve the foam in the finished beer. Obviously the anti-foam must be removed from the beer before packaging and settling and filtration are two methods used to remove the anti-foam. Commercial brewers usually filter their beers, but anti-foam removal can be performed without requiring longer aging times. At home I would follow the manufacturers recommendations with respect to gravity removal and not try to shave days off the settling time specified.

This is all sounding pretty good. No foam blowing out of the fermenter, improved hop utilization and improved foam stability! It makes you wonder why all brewers do not use anti-foams. I think one potential downside to anti-foams is an increase in so-called braun hefe trub in the fermenting beer. This is the darkly colored schmoo that sticks to the wall of the fermenter when foam is allowed to form during fermentation. When the foam collapses as fermentation wanes this stuff is partially removed because it sticks to the side of the tank.

Some brewers remove braun hefe from the tops of fermenters by skimming open tanks and some brewers encourage some foam to flow from the tops of closed tanks into special foam chambers designed to remove braun hefe from beer. Braun hefe removal is done to produce a mellower flavor in the finished beer. To my knowledge, the only real downside to beer flavor when using anti-foams could be an increase in harsh flavors associated with braun hefe.

Some commercial brewers are hesitant to use brewing aids because of the perception the beer-drinking public may have. However, brewing aids are not considered ingredients because they do not survive into the finished beer. Silica gels are widely used to stabilize beer against chill haze and these compounds, like silicon anti-foams, are completely removed from beer. Even the restrictive Rheinheitsgbot does not prevent German brewers from using silica gels because they are not ingredients.

The concern that some brewers have is that labeling rules can always be changed. If a new labeling law required the brewer to list brewing ingredients and aids this would be bad for the brewer who must list big words on their labels. Terms like silica gel, polyvinylpyrrolidone (PVPP) and dimethylpolysiloxone sound pretty scary to the average beer consumer. So that's my take on anti-foams!

Water chemistry question

I just moved to a new house and ever since, my beer has not tasted as good, especially the lighter beers. After sending in my water to get tested (results shown in the table below) I believe I have found my answer: high bicarbonates. They are very high and are probably affecting my mash pH. I have read that if you boil your water you can remove some of the bicarbonates. If this is true, what method is used?

Ca^{+2}	Mg^{+2}	Na^{+1}	SO_4^{-2}	Cl^{-1}	HCO_3^{-1}	pH
103	45	119	8	207	444.8	7.8

David Skreczko
Delafield, Wisconsin

There is no doubt that you have more bicarbonate in your water than you would want for any style! Even dark beers, like stout and porter, typically have about a third the level of bicarbonates contained in your water. Bicarbonates help balance the acidity of the dark special malts in these styles. In pale beer styles, bicarbonates in the water increase mash pH and increase the extraction of tannins from the malt husk. High mash pH also results in a high beer pH which tends to result in a flavor that is not as clean and crisp as beers with lower pH values. This is especially true in paler beers.

To me, the ideal brewing water has very low bicarbonate levels and can be used for a variety of styles. If you actually want more bicarbonate for certain styles it can always be added.

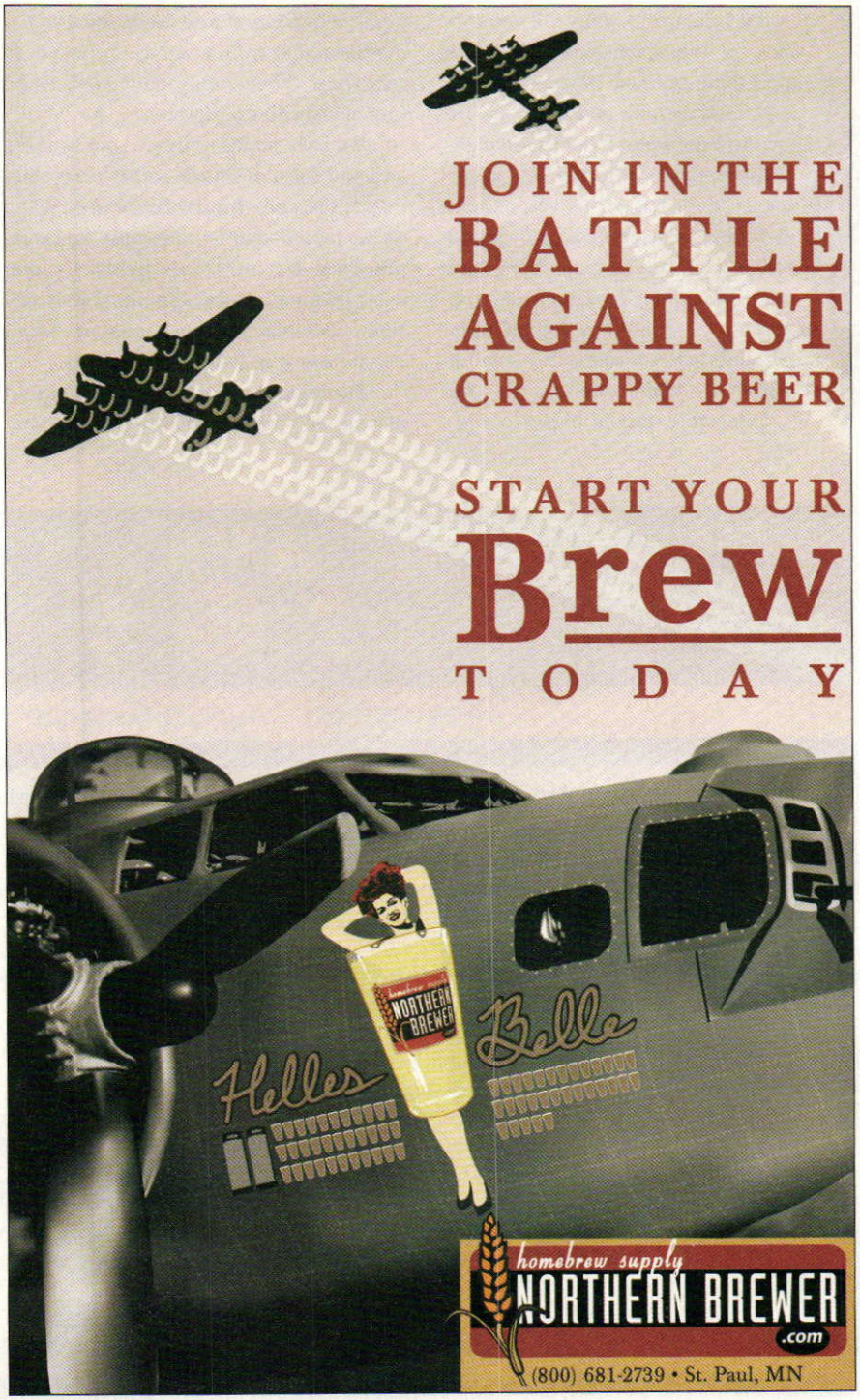
Bicarbonate levels can be decreased by boiling water for several minutes. After boiling, allow the solid white powder to settle out and siphon the clear water off of the solids. One chemical reaction describing this is as follows:

$$Ca^{+2} + 2HCO_3^{-1} \rightarrow CO_{2(g)} + H_20 + CaCO_{3(s)}$$

I realize many of our readers are rusty on their chemistry and this equation may not be all that exciting! In plain terms, bicarbonate reacts with calcium when boiled to form carbon dioxide, water and calcium carbonate. Since the carbon dioxide is driven out of the water during boiling, the reaction can be considered irreversible in the context of this topic. For every one part atom of calcium in you water you can remove two parts molecules of bicarbonate. Now I'll skip directly to the result.

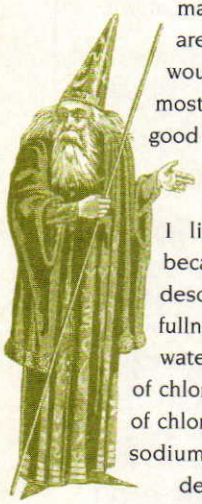
You can remove 314 ppm bicarbonate from your water if all the calcium were consumed in this reaction. The same reaction occurs with magnesium and if you reacted all of the magnesium with bicarbonate you could remove 229 ppm of bicarbonate. In reality, these reactions are not 100% and are influenced by the very limited solubility of calcium carbonate and magnesium carbonate.

In your case, you cannot remove all of the bicarbonate in your water by reacting with calcium and magnesium because there is not enough present. If the water had more bicarbonate than could be removed with the available calcium and magnesium you could add more calcium to boost the calcium levels so that you



could remove most of the bicarbonate. Things are getting a bit complicated. Perhaps adding salts, boiling large volumes of water and siphoning the water before mashing in is a lot of work!

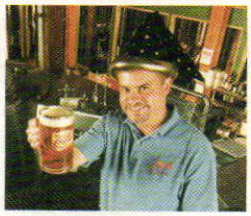
When I look at your water analysis I see a couple of other things that stand out. Your water is also high in magnesium and sodium and very high in chloride. All of these affect beer flavor and may be the main reason that your light beers are not as clean flavored as you would desire. Boiling will remove most of the magnesium. This is a good thing because magnesium can lend metallic and bitter flavors to beer when it levels are high. I like some chloride in water because it adds what some people describe as sweetness and palate fullness to beer. I usually brew with water containing less than 100 ppm of chloride compared to the 207 ppm of chloride in your water. The level of sodium is high enough to be detectable and is likely to contribute to salty flavors in your beer.



The best advice I can offer is to use water that has been demineralized as your starting point. Reverse osmosis (RO) water is readily available at your local grocery storein most areas of the country, especially those areas of the country with really hard water like yours. You can also purchase distilled or deionized water in many grocery stores. Most water is treated with RO as distillation and deionization are more expensive methods. When you begin with mineral-free water you add the minerals that you want as opposed to removing those you don't want when beginning with weird water.

We have an RO system at our brewery and add calcium sulfate and calcium chloride to the water for all of our beers. When we want carbonate in the water, for example when we brew dark beers, I prefer using sodium bicarbonate rather than calcium carbonate because sodium bicarbonate easily goes into solution.

My advice to most brewers is to avoid playing with water if you can. Water chemistry is a confusing topic to most brewers and when you begin selectively removing some components from the water it gets more complex. Your water is clearly ill suited for brewing and you need to do something with your water. The easiest thing to do is to run down to a store that sells RO water by the gallon and stock up before brewing. You can then adjust this water with minerals or blend it with your water to get reasonable levels.



BYO Technical Editor Ashton Lewis has been answering homebrew questions as his alter ego Mr. Wizard for the last 12 years. Do you have a question for him? Send inquiries to *Brew Your Own*, 5053 Main Street, Suite A, Manchester Center, VT 05255 or send your e-mail to wiz@byo.com. If you submit your question by e-mail, please include your full name and hometown. In every issue, the Wizard will select a few questions for publication. Unfortunately, he can't respond personally. Sorry!

WEYERMANN

Weyermann : Superb German Malts

Weyermann is Germany's oldest and finest maltster, producing a wide range of barley, wheat and rye malts to optimize every beer!

- **Superb quality Pilsner, Pale Ale, Vienna and Munich base malts**
- **Specialty malts to match just about any recipe**
- Weyermann crystal and roast malts are produced in rotary roasting drums rather than in the usual flatbed kilns, producing a more consistent, high quality end product
- **NEW** authentic Bavarian Pilsner malt
- **SINAMAR®** Liquid All-Malt beer coloring extract now available in 4 oz. bottles for the homebrewer!

Distributed in the United States by Crosby & Baker, from wholesale (strictly!) warehouses in:

- Westport, Massachusetts
- Atlanta, Georgia
- Salt Lake City, Utah
- Baltimore, Maryland
- Sacramento, California

Websites for more information Specs & other great stuff:
www.WeyermannMalt.com www.Crosby-Baker.com Email: Info@Crosby-Baker.com

CROSBY & BAKER LTD
Call us for great products and prices: 1.800.999.2440

Witbier

The cloudy beer with the silver lining

by Jamil Zainasheff

Having just arrived in Paris, I was exhausted. I was looking forward to a bed with a cool, fluffy, white pillow, but our room wasn't ready. We wandered down to the local café to have a bite to eat and I found a fluffy pillow of another sort to ease my exhausted state, Blanche de Bruges. On draft, this beer has a huge, white head, which persists until the last drop. Ah, it was beer magic for a weary traveler.

In the 17th and 18th Centuries, witbier (bière blanche in French) was the dominant beer style in Brussels. The breweries in Leuven and Hoegaarden, 15 to 30 miles (24 to 48 km) east of Brussels, supplied witbier to Brussels and other European cities. Of course, as it has been with many unique European beer styles, the damage done during two World Wars and competition from modern lager brewers have had a great impact on smaller breweries. Eventually witbier popularity waned and after World War II the style became virtually extinct. Luckily, Pierre Celis revived the style with Oud Hoegaards Bier, later known and popularized as Hoegaarden in the United States.

photo by Jim Witmer

The Blanche de Bruges I enjoyed in Paris is a fine example of the Witbier style, with a very light sweetness balanced by a citrusy orange fruitiness and a fairly crisp, refreshing finish. The best examples of the style always seem to have a soft, creamy feel without being cloying or heavy. Witbeer has gentle perfumey, spicy, herbal, citrusy notes with none boldly standing out. The flavors and aromas come together to form a light and refreshing beer with a slightly dry and fruity finish. These are moderate alcohol beers in the 4.5 to 5.5% ABV range. Held to the light, they are quite cloudy from starch haze, with a very light straw to light golden color in the background.

The grain bill for a witbier is not as flexible as many other beer styles. It requires unmalted wheat and continental Pilsner malt as the base. If you can't get those ingredients, you can try malted wheat and domestic two-row malt, but the flavor, aroma, mouthfeel and appearance just won't have that soft, slightly sweet and gently grainy character. Additional grains often include oats and a melanoidin rich malt like Munich. I think the addition of 5 to 10% oats is critical for brewing a great witbier. They not only give a slight background complexity to the malt character, they also add quite a bit to mouthfeel. Some describe the character of oats in beer as having a "silky" feel and I agree. The unmalted wheat and oats also add to the cloudy white color of the beer and the persistent head. Munich malt is a common ingredient in many witbier recipes. This is one of the ingredients that could be left out, but I like the way it adds a slight bready note that is warmer in character than the base malts. Added with restraint,

WITBIER by the numbers

OG = 1.045–1.053 (11.0–12.9 °P)
FG = 1.008–1.012 (2.1–3.1 °P)
SRM = 2–4 (4–8 EBC)
IBU = 10–20
ABV = 4.5–5.5% (3.6–4.3% ABW)

(story continued on page 21)

RECIPE

Blanche Oreiller

(5 gallons/19 L, all-grain)
OG = 1.050 (12.4 °P)
FG = 1.011 (2.8 °P)
IBU = 20 SRM: 4 ABV = 5.0%

Ingredients

4.5 lb. (2.0 kg) flaked wheat (1 °L)
4.9 lb. (2.2 kg) Pilsner malt (1.6 °L)
1.1 lb. (0.5 kg) flaked oats (1 °L)
0.25 lb. (113 g) Munich malt (8 °L)
0.5 lb. (227 g) rice hulls or other natural filter
4 AAU Hallertau hops (60 mins) (1.0 oz/28 g of 4% alpha acids)
1.5 oz. (43 g) fresh citrus zest (5 mins)
0.4 oz. (11 g) crushed coriander seed (5 mins)
0.03 oz. (1 g) dried chamomile flowers (5 mins)
Wyeast 3944 (Belgian Witbier), White Labs WLP400 (Belgian Wit Ale) or Brewferm Blanche dried yeast

Step by Step

Mill the grains (including the flaked grains, but excluding the rice hulls). Mix the rice hulls into the grain post milling and dough-in targeting a mash of around 1.5 quarts of water to one pound of grain (a liquor-to-grist ratio of about 3:1 by weight) and a temperature of 122 °F (50 °C). Hold the mash at 122 °F (50 °C) for 15 minutes then raise the temperature over the next 15 minutes to 154 °F (68 °C). Hold until conversion is complete, about 60 to 90 minutes. Raise the temperature to mash out at 168 °F (76 °C). Sparge slowly with 170 °F (77 °C) water, collecting wort until the pre-boil kettle volume is around 6.5 gallons (25 L) and the gravity is 1.039 (9.7 °P).

The total wort boil time is 90 minutes, which helps reduce the SMM present in the lightly-kilned

recipe continued on page 20

recipe continued from page 19

Pilsner malt and results in less DMS in the beer. Add the bittering hops with 60 minutes remaining and the spices with five minutes left in the boil. Do not bother with Irish moss or other kettle finings. Chill the wort rapidly to 68 °F (20 °C), let the break material settle, rack to the fermenter and aerate thoroughly.

Pitch ten grams of properly rehydrated dry yeast or use two liquid yeast packages. Alternatively make a 2 qt. (2 L) starter using one package of liquid yeast. Begin fermentation at 68 °F (20 °C) slowly raising temperature to 72 °F (22 °C) by the last one-third of fermentation. When finished, carbonate the beer to approximately 2.5 to 3 volumes of CO_2.

Blanche Oreiller

(5 gallons/19 L, partial mash)
OG = 1.050 (12.4 °P)
FG = 1.011 (2.8 °P)
IBU = 20 SRM = 5 ABV = 5.0%

Extract
5.5 lb. (2.5 kg) wheat liquid malt extract (4 °L)
0.25 lb. (113 g) Munich liquid malt extract (9 °L)
1.0 lb. (0.45 kg) Pilsner malt (1.6 °L)
1.13 lb. (0.51 kg) flaked oats (1 °L)
4 AAU Hallertau hops (60 min.) (1.0 oz./28 g of 4% alpha acids)
1.5 oz. (43 g) fresh citrus zest (5 min)
0.4 oz. (11 g) crushed coriander seed (5 min)
0.03 oz. (1 g) dry chamomile flowers (5 min)
Wyeast 3944 (Belgian Witbier), White Labs WLP400 (Belgian Wit Ale) or Brewferm Blanche dried yeast

Step by Step
Mill the grains (including the oats) and place loosely in a grain bag. The oats will swell, so avoid packing them too tightly in the bag. Use more bags if needed. Steep the bag in 2 gallons (~8 L) at a temperature of 154 °F (68 °C) for about 60 minutes. Lift the grain bag out of the steeping liquid and rinse with warm water. Allow the bags to drip into the kettle for a few minutes while you add the malt extract. Do not squeeze the bag. Add enough water to the steeping liquor and malt extract to make a pre-boil volume of 5.9 gallons (22 L) and a gravity of 1.043 (10.6 °P). Stir thoroughly to help dissolve the extract and bring to a boil.

Once the wort is boiling, add the bittering hops. The total wort boil time is one hour after adding the bittering hops. Do not bother with Irish moss or other kettle finings. Add the spices with five minutes remaining. Chill the wort rapidly to 68 °F (20°C), pitch the yeast and aerate thoroughly. Follow the fermentation and packaging instructions for the all-grain version.

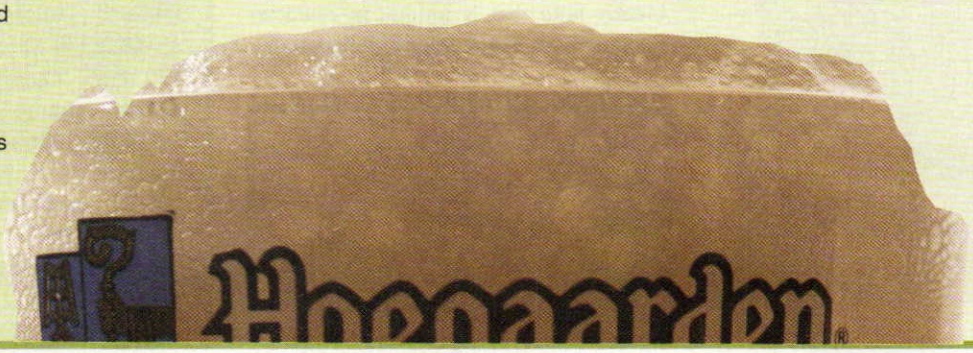
Blanche Oreiller

(5 gallons/19 L, extract with grains)
OG = 1.050 (12.4 °P)
FG = 1.011 (2.8 °P)
IBU = 20 SRM = 5 ABV = 5.0%

Ingredients
6.6 lb. (3 kg) wheat liquid malt extract (4 °L)
0.25 lb. (113 g) Munich liquid malt extract (9 °L)
1.1 lb. (0.5 kg) flaked oats (1 °L)
4 AAU Hallertau hops (60 min.) (1.0 oz./28 g of 4% alpha acids)
1.5 oz. (43 g) fresh citrus zest (5 mins)
0.4 oz. (11 g) crushed coriander seed (5 mins)
0.03 oz (1 g) dry chamomile flowers (5 mins)
Wyeast 3944 (Belgian Witbier), White Labs WLP400 (Belgian Wit Ale) or Brewferm Blanche dried yeast

Step by Step
In this extract recipe, the oats are not going to provide any sugars for fermentation so the amount of malt extract is greater than the other recipes. Place the oats loosely in a grain bag. Since the oats will swell, avoid packing them too tightly in the bag. Use more bags if needed. Steep the bag in 2 gallons (~8 L) of 170 °F (77 °C) water for about 30 minutes. Lift the grain bag out of the steeping liquid and rinse with warm water. Allow the bags to drip into the kettle for a few minutes while you add the malt extract. Since this is only oats, squeeze the bags to extract the liquid. Add enough water to the steeping liquor and malt extract to make a pre-boil volume of 5.9 gallons (22 L) and a gravity of 1.043 (10.6 °P). Stir thoroughly to help dissolve the extract and bring to a boil.

Once the wort is boiling, add the bittering hops. The total wort boil time is one hour after adding the bittering hops. Do not bother with Irish moss or other kettle finings. Add the spices with five minutes remaining. Chill the wort rapidly to 68 °F (20 °C), pitch the yeast and aerate thoroughly. Follow the fermentation and packaging instructions for the all-grain version.



Munich, aromatic or melanoidin malt gives a nice little complexity to the beer. Keep the amount to 5% or less. If you over do it, the flavor becomes too strong and works against the soft grainy background.

It is tricky to make a great extract witbier. This is a beer that benefits from all-grain or partial mash brewing to convert the unmalted wheat and oats. If using extract and steeping grains only, you'll need to increase the amount of base malt, as neither the oats nor the unmalted wheat will add any fermentable sugars from steeping alone. To create a starch haze, you can add a tablespoon of wheat flour to the boil.

Witbier can be brewed with a wide variety of hops, but I prefer German noble hops for their gentle, clean, bittering character. While the BJCP style guide hints at low-hop flavor and aroma being acceptable, you're better off with neither. Hop flavor and aroma in this beer seems to battle with the other subtle spice notes. You absolutely don't want to go with any bold American-type hops. I know it sounds like a good idea to use citrusy American-type hops in a beer that needs some citrus character, but it doesn't work in a witbier. There are too many other flavors in the hops that don't go well with this style. The spices, yeast character and carbonation also add dry, slightly bitter notes and accentuate the hop bitterness. Thus, in order to balance this style, you often need less hop bitterness than you might need in a non-spiced beer.

A common mistake many brewers make when first attempting this style is going overboard on the addition of spices. While the herbal, citrus and spicy notes are obviously present, the best witbiers use those flavors and aromas as subtle highlights to the malt and fermentation character. The flavors and aromas from spices should blend harmoniously with the fermentation-derived esters and phenolics, not overpower them. However, this is often tricky to accomplish, as many spices vary in strength based on the source of the spice. How you add them to the beer also makes a big difference.

There are two basic times to add spices to a beer: during the boil or post fermentation. The easiest is to toss them into the boil during the last few minutes, letting heat and the water extract the spice character. This is a good method for many spices because there is no danger of contamination and extraction happens quickly. The drawback is that you don't know how much spice character you're getting until you taste the beer after fermentation. Another issue is that the character of many spices change once heated and can seem "cooked" after a short time in the boil. Even with those potential drawbacks, adding spices late in the boil, as the Belgians do, is a good method for witbier. The alternative is adding spices directly to the beer. Adding spices after the bulk of fermentation is done allows better precision, as you can taste the beer every few days to see how the flavor and aroma develop. With this method there is some danger of contamination, especially in beers with moderate alcohol levels like witbier. You can also dose the beer with spices boiled gently in a little water.

The best technique for adding spices to witbier is a combination of methods. Add them late in the boil, but use restraint. Start out with an amount you know will not be overwhelming. If it turns out the spicing wasn't enough, you can always bump it up by boiling some spices in a little water and adding them in, or adding dry spices post fermentation.

The best way to add citrus character is with fresh citrus. The petrified bits of orange peel often used may be authentic, but fresh zest has a much brighter character. Select tangerines or oranges (that aren't green) with a nice bold, fresh aroma. If you have a citrus tree, let the fruit ripen longer, building a rich fruit character. Use a citrus zester to peel the very surface of the skin and avoid digging deep into the white pith as it is bitter and lacks citrus character. Measure the zest by weight, targeting about one to two ounces (28 to 57 g) in a 5-gallon (19-L) batch.

Coriander is probably the trickiest of the witbier spices to balance properly. Not only does the spice intensity vary considerably among suppliers and sources, but how you add it makes a big difference, too. I gently crush the coriander with the back of a heavy spoon to expose the inside of the seeds, which gives it a fairly strong, spicy character versus whole seeds. The level of coriander is probably the area most brewers overshoot, resulting in a really peppery beer. The desired result is a gentle, background spicing, not an overwhelming one. If you have fairly fresh coriander, start with 0.4 oz (11 g) per 5-gallon (19-L) batch added during the last five minutes of the boil.

Randy Mosher, in his book *Radical Brewing*, discusses the use of chamomile as an important part of a witbier recipe. It does not hurt to add the chamomile, and it is quite easy. If you have fresh chamomile, use about 0.25 oz. (7 g); otherwise, use chamomile teabags. Many chamomile teas have additional herbs and spices so only use types with just chamomile flowers. You'll need about three tea bags for a 5-gallon (19-L) batch, although I've used as many as ten bags without it becoming overwhelming. Cut open the bags and toss the flowers into the boil for the last five minutes.

As in most beer styles, the yeast makes a big difference in the character of the beer. I have a very strong preference for Wyeast 3944 (Belgian Witbier) or White Labs WLP400 (Belgian Wit Ale). If you must use dried yeast, I've heard that Brewferm Blanche will do a respectable job. Pitch the yeast at 68 °F (20 °C) and hold the temperature steady for the first two-thirds of fermentation. This moderate temperature keeps the esters and phenols from getting out of hand. As the fermentation slows, slowly raise the temperature to 72 °F (22 °C) over the last couple days, which increases the activity of any still-active yeast cells and helps ensure complete attenuation. This is important to a crisp finish to the beer. When you're finished, carbonate the beer to approximately 2.5 to 3 volumes of CO_2.

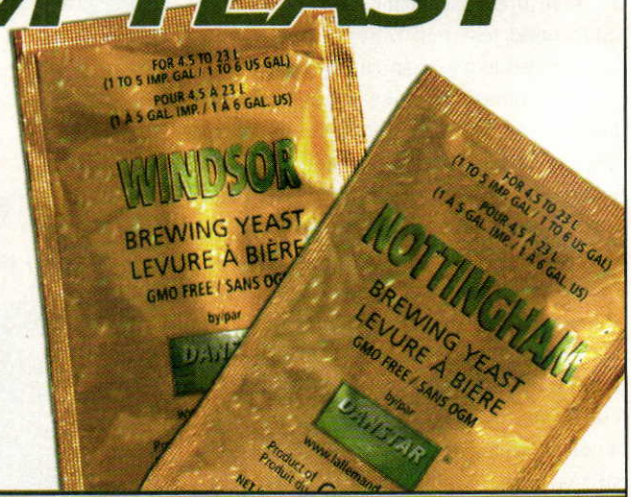
Jamil Zainasheff writes Style Profile in every issue of Brew Your Own.

Premium Beer Kits Include
PREMIUM YEAST

Before you buy your next beer kit, make sure it includes genuine Danstar dry yeast. Danstar yeast is true brewing yeast, selected for proven performance and superior flavor. Every batch of Danstar yeast is tested to insure it meets the most stringent standards of quality and purity, giving brewers the unmatched consistency and ease-of-use that only dry yeast can provide.

Bring out the best in your beer. Visit us at Danstar.com for the complete line of Danstar brewing products.

Get *The Dry Yeast Advantage* with Danstar.



www.DANSTAR.com

2007 LABEL WINNERS CONTEST

Each year, as the many hundreds of entries for our annual label contest start filtering in, a feeling of anticipation grows among the BYO staff. Many a battle has been won and lost among the judges over the Grand Champion, Gold, Silver and Bronze winners. Personal favorites are chosen, alliances are formed, battles are waged and compromises are few. OK, the real truth is it's very hard to pick the best labels from all the creative and diverse entries we see, and this year was no exception. From the classic to the graphic, we eyeballed them all — agonizing over their finer points, poring over their stories and asking each other, "What do you think?", "What would that look like on a bottle?" and "Why didn't I think of that?!" In the end, we all developed a real sweet tooth for our Grand Champion and narrowly agreed on the rest. Take a minute to drink in this year's top designs, and winners — don't forget to take a bow!

GRAND CHAMPION

Alan Guidera
Rochester, New York

Inspired by "Charlie and the Chocolate Factory," one of the all-time best (and some may say spookiest) films about candy, Alan cooked up the idea for this label after adding cocoa powder, roasted cacao beans and chocolate essence to a stout that even Willy himself could love. "Now that I'm older, winning a tour of a chocolate factory doesn't seem so fantastic anymore. However, a lifetime supply of beer would be a dream come true!"

Prizes: 40-quart stainless steel brew pot with threaded valve opening and stainless steel ball valve from **Polar Ware Company**; Gift certificate from **Grape and Granary**; Gift card from **Bader Beer & Wine Supply Inc.**; Fleece jacket from **Muntons p.l.c.**; Organic beer ingredients kit from **BrewOrganic.com**; Gift certificate from **Homebrewers Outpost & Mail Order Co.**; Yeast coupons from **White Labs, Inc.**; Books from **Above the Rest Homebrewing Supplies**

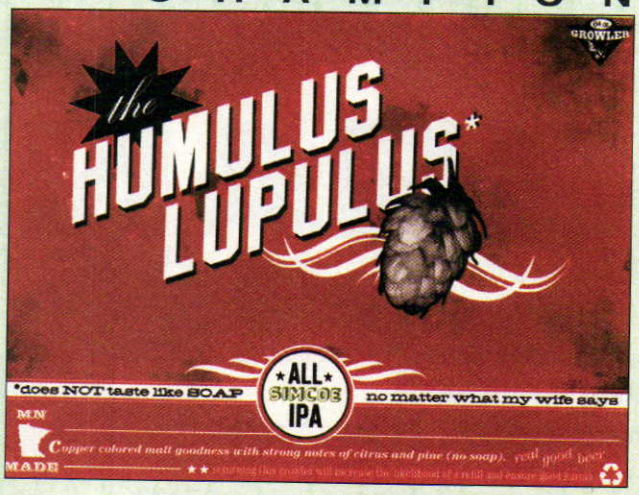
GOLD CHAMPION

Chris Hadden
Portland, Maine

We may all move into Chris' neighborhood where his postman, Mike (an Old Port legend & motorcycle enthusiast), is the king of special deliveries. "Not only does he deliver bills and catalogs, but on occasion he drops off his latest brew — after hours — for a tasting." This label is for Mike's outstanding red ale.

Prizes: 25-liter super reflux oil extractor (as used in New Zealand for distillation) with necessary turbo yeast, sugars and Still Spirits liqueur essences from **Brewcraft USA**; Gift card from **Bader Beer & Wine Supply Inc.**; Organic beer ingredients kit from **BrewOrganic.com**; Gift certificate from **Homebrewers Outpost & Mail Order Co.**; Yeast coupons from **White Labs, Inc.**

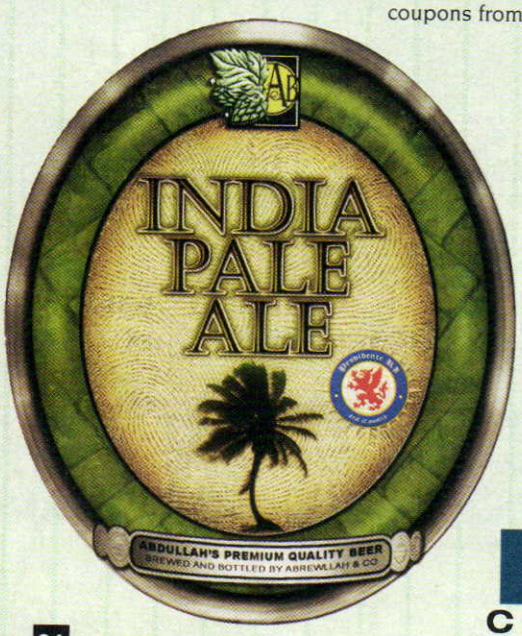
SILVER CHAMPION



Geoff Haas
Saint Paul, Minnesota

It's a typical he says/she says situation. Geoff says his favorite homebrew tastes citrusy, floral, resinous or piney. His wife says, simply, "soap." To honor his hoppy habit, Geoff designed this label for his home growlers and said he even shared a few with his wife's IT group when they helped fix his computer. "I spent a little more time (on it) than I orginally planned, but once I started it was hard to stop!"

Prizes: New 5 lb. CO_2 tank from **KegKits.com**; Gift card from **Bader Beer & Wine Supply Inc.**; Organic beer ingredients kit from **BrewOrganic.com**; Gift certificate from **Homebrewers Outpost & Mail Order Co.**; Yeast coupons from **White Labs, Inc.**



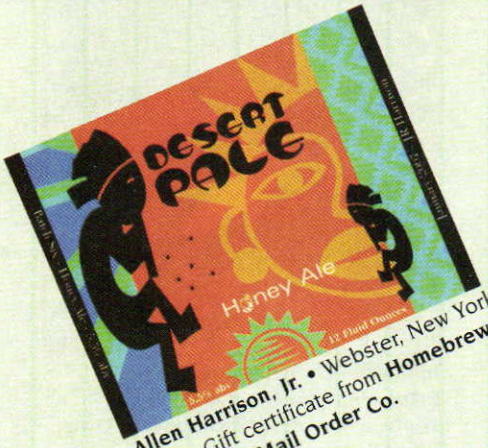
Steve Micallef
N. Kingstown, Rhode Island

Steve & his friend Abdullah Khaliqi have an understanding about Abdullah's Abrewllah and Co. homebrews. "After he brews the beer, I make the labels," Steve said. Naturally, they both enjoy the results.

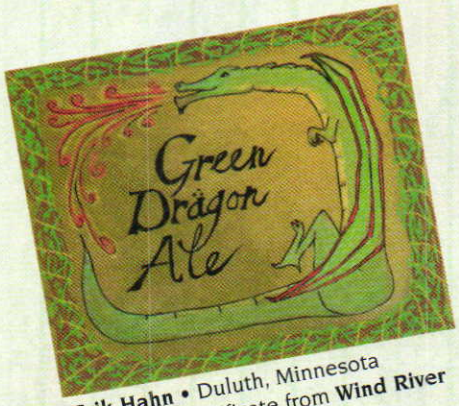
Prizes: Party Pig set-up package from **Quoin Industrial**; Four gross of bottle caps and two 28-inch plastic spoons from **The Flying Barrel**; Gift card from **Bader Beer & Wine Supply Inc.**; Organic beer ingredients kit from **BrewOrganic.com**; Gift certificate from **Homebrewers Outpost & Mail Order Co.**; Yeast coupons from **White Labs, Inc.**

BRONZE CHAMPION

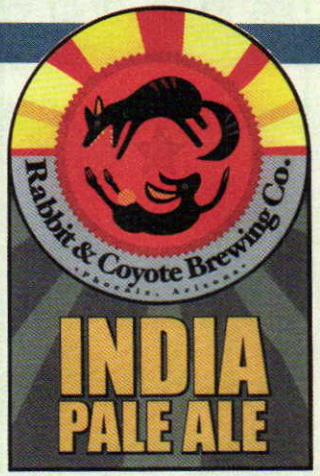
HONORABLE MENTION



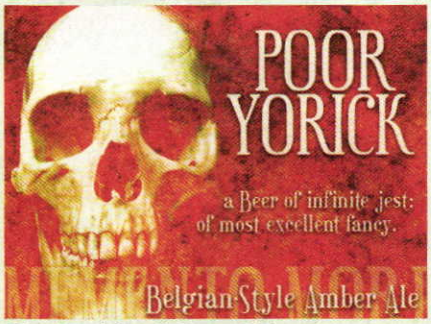
Allen Harrison, Jr. • Webster, New York
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**



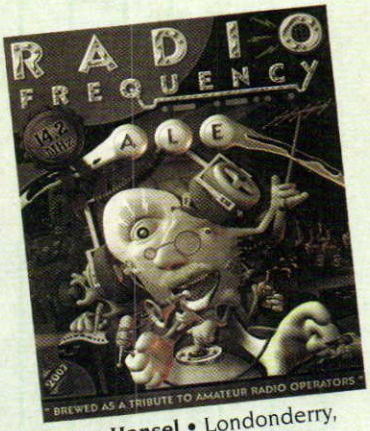
Erik Hahn • Duluth, Minnesota
Prize: Gift certificate from **Wind River Brewing Co.**



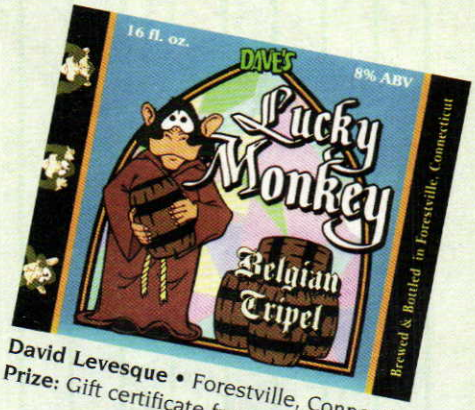
Bill Paterno • Downingtown, Pennsylvania
Prize: Excalibur 463 Brew Master from **Rubino's Homemade Wine & Beer Supply**



Chad Parish • Auburn, Alabama
Prize: DVD combo pack from **Basic Brewing™**

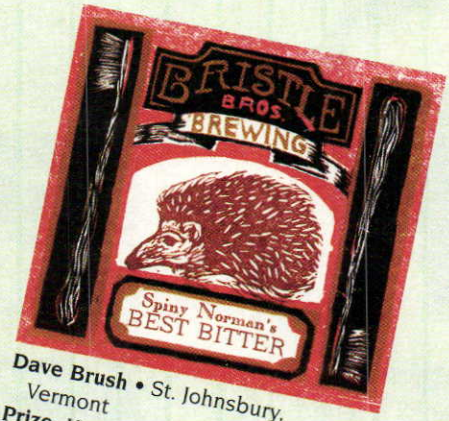


Doug Hansel • Londonderry, New Hampshire
Prize: Gift certificate from **Beer and Wine Hobby**



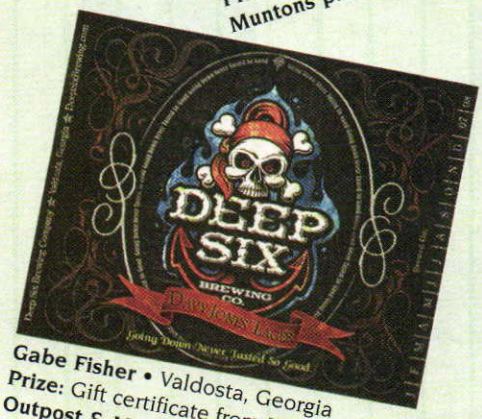
David Levesque • Forestville, Connecticut
Prize: Gift certificate from **Maltose Express**

Francis Bernard • Rivière-du-Loup, Québec
Prize: Fleece jacket from **Muntons p.l.c.**



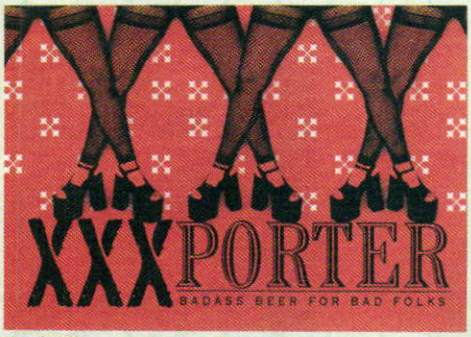
Dave Brush • St. Johnsbury, Vermont
Prize: Hooded sweatshirt from **White Labs, Inc.**

Bill Oates • Pittsburgh, Pennsylvania
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**



Gabe Fisher • Valdosta, Georgia
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**

HONORABLE MENTION

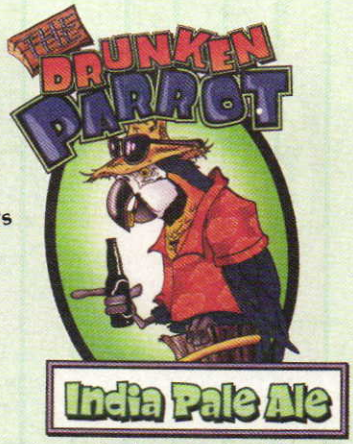


Karl Almgren • Grand Junction, Colorado
Prize: Organic beer ingredients kit from **BrewOrganic.com**

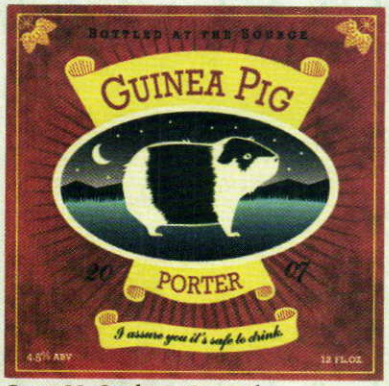
Glenn Fehnel • Lancaster, Pennsylvania
Prize: Gilda floor corker from **Rubino's Homemade Wine & Beer Supply**

John Arneil • Sydney, Australia
Prize: Half liter German stein from **White Labs, Inc.** and **Brew Your Own magazine**

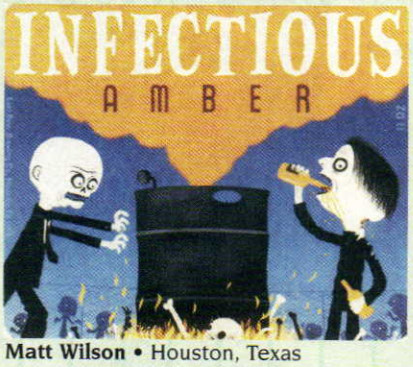
Robert Bullen • Eagan, Minnesota
Prize: Pilsner glass set from **BeerCollections.com**



Lance Leslie • Concord, North Carolina
Prize: Gift certificate from **High Gravity Homebrewing and Winemaking Supplies**

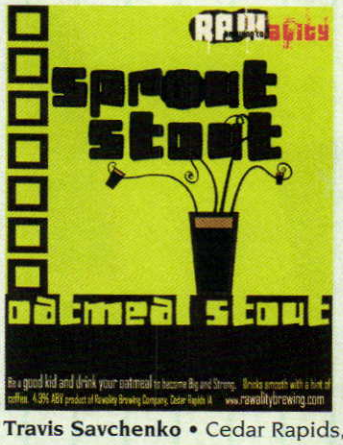


Sean McCauley • Seward, Pennsylvania
Prize: Long sleeve denim shirt from **White Labs, Inc.**



Matt Wilson • Houston, Texas
Prize: Organic beer ingredients kit from **BrewOrganic.com**

Jenn Alexander • Fenton, Missouri
Prize: Gift certificate from **Homebrewers Outpost & Mail Order Co.**



Travis Savchenko • Cedar Rapids, Iowa
Prize: Fleece jacket from **Muntons p.l.c.**

Honey Parker • Los Angeles, California
Prize: Pint glass set from **BeerCollections.com**

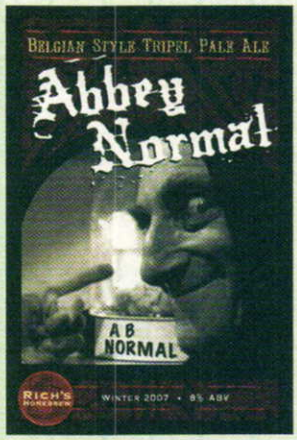
EDITOR'S CHOICE

S. Massimi • Coatesville, Pennsylvania

Barry Fitzgerald • Lawrence, Kansas

Chet & Vivica Crowser • Lolo, Montana

Trevor Holmberg • Poulsbo, Washington



Rich Lynch • Medford, New York

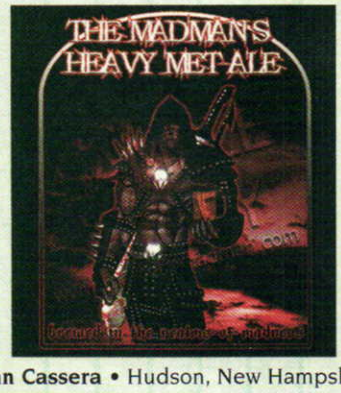
Gale Wagner • Nashville, Tennessee

Brent Paugh • Cypress, Texas

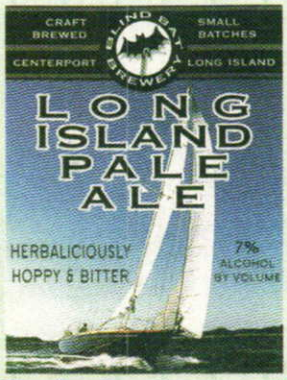
Michael Forer • Chandler, Arizona

Eric Varchola • Davenport, Iowa

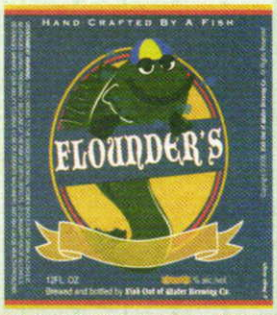
David Van Keuren • Coatesville, Pennsylvania



John Cassera • Hudson, New Hampshire



Paul Dlugokencky • Centerport, New York



Jeremy Lees • Morristown, New Jersey

Josh Schipkowski • St. Louis, Missouri

BYO BACK ISSUE SALE!

Buy 5 Issues...Get 5 More Issues FREE!

We are offering readers a very special deal on our limited quantities of back issues. Buy any 5 issues for $25 (plus $10 shipping) and receive 5 more issues for FREE! Buy 5 and get 5 FREE! Choose from these collectible classics still in stock from 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005 and 2006.

HURRY! SUPPLIES ARE LIMITED! NOW AVAILABLE ONLINE AT WWW.BREWYOUROWNSTORE.COM

DEC. 95
- Controlling Beer Color
- Winter Brew Recipes

APR. 96
- Apartment Brewing
- Lager & Kegs

MAY 96
- Lautering Tips
- Troubleshooting Guide

JULY 96
- Big Batch Brewing
- Scotch Ale

APR. 97
- Low-Alcohol Recipes
- American Pale Ale Recipes

AUG.97
- Make Your Own Malt
- Dry Hopping Tips

SEPT. 97
- Build a Keg Cleaner
- Tips from Sierra Nevada Brewing

OCT. 97
- Extract Kit Guide
- Decoction Mashing

NOV. 97
- Refining Your Mash
- Brewing with Adjuncts

FEB. 98
- Belgian Lambic Tour
- Belgian Abbey Ale Recipes

MAR. 98
- Super Hoppy Recipes
- Lautering Guide

APR. 98
- Scotch Ale Recipes
- Choosing the Right Yeast

JUNE 98
- Hop Profiles and Tips
- Malt Cooler Recipes

JULY 98
- 15 Clone Recipes
- 3 Beers, 1 Mash

AUG. 98
- Easy Beer Calculations
- Yeast Pitching

OCT. 98
- Great Bock Recipes
- Choose the Right Kit

NOV. 98
- Kegging Techniques
- Using Liquid Yeast

DEC. 98
- Cask Conditioning Tips
- Convert Freezer to Beer Chest

JAN. 99
- Aging in Wood
- Figuring Hop Bitterness

FEB. 99
- Malta Yeast Starter
- Organic Homebrewing

MAR. 99
- Imported Clone Recipes
- Build an Electric Brew Stove

APR. 99
- Kegging Guide
- Understanding Brewing Water

MAY 99
- Perfecting Pale Ales
- Nitrogen Homebrews

JUNE 99
- Nut Brown Ale, Pilsner Recipes
- Experimenting w/ Grains

JULY 99
- Summer Homebrew Recipes
- Hempen Ale Recipe

AUG. 99
- Wit, Kölsch Recipes
- American Lager Clones

SEPT. 99
- Build a $50 Mash Tun
- Lager Techniques

OCT. 99
- Homebrewing Soda Pop
- Doppelbock Recipes

NOV. 99
- Hop Flavor Chart
- Easy Partial Mashing

DEC. 99
- Cutting Edge Equipment
- Increasing Batch Size

JAN. 00
- 7 Czech Beer Recipes
- Your First Brew

FEB. 00
- High-Gravity Brewing
- Foreign Clone Recipes

MAR. 00
- Master Beer Conditioning
- Beer Tasting Lessons

APR. 00
- Making Smoked Beers
- Your First Keg

MAY 00
- Your First Mash
- Understanding Your Water

SUMMER 00
- 4 British Clone Recipes
- Put a Spigot in Your Brew Kettle

OCT. 00
- 20 Autumn Extract Recipes
- Build a Counterflow Wort Chiller

NOV. 00
- 6 Belgian Clone Recipes
- Expert Belgian Brewing Tips

DEC. 00
- Brewing Lagers
- Homebrew Lab Gizmos

JAN. 01
- Brew Indigenous Beers From 4 Continents
- Making Root Beer

FEB. 01
- 5 German Clone Recipes
- Decoction Step-by-Step

MAR. 01
- Growing Yeast Strains at Home
- Brew Low-Carb Beer with Beano®

APR. 01
- Grow Your Own Hops
- Strong Ales

MAY 01
- 20 Extract Recipes for Spring
- Build a Counter PressureBottle Filler

SUMMER 01
- 5 Clone Recipes for Summer
- Build a Big-Batch Mash Tun

SEPT. 01
- Learn to Brew with No-Boil Kits, Extract with Grains, Partial Mash, Single-Infusion Mash and Step Mash

NOV. 01
- Using and Building With Stainless Steel
- Build a Draft Jockey Box

DEC. 01
- Brewing Scotland's Classic Beers
- Build an Easy RIMS

JAN./FEB. 02
- 8 Ski Town Clone Recipes
- Thomas Jefferson's Homebrew

MAR./APR. 02
- Understanding Malt
- Computer Brewing Software

MAY/JUNE 02
- Faster Brewing Tips
- Big Batch Brews

JULY/AUG. 02
- 21 Regional U.S. Recipes
- Brewing with Fruit

SEPT. 02
- Homebrew Trouble shooting Guide
- Build a Draft Beer Fridge

OCT. 02
- Better Extract Techniques
- One Batch, Two Beers

NOV. 02
- 4 Dream Homebrew Set-ups
- Indoor Brewing Systems

BUY 5 ISSUES...GET 5 MORE ISSUES FREE!

DEC. 02
•Monster Holiday Beer Recipes
•Oatmeal Stout, Coffee Beer

JAN./FEB. 03
•Brewing Porter
•Cleaning & Sanitation Made Easy

MAR./APR. 03
•Selecting Hops to Style
•Introduction to Kegging

MAY/JUNE 03
•How to Control the Color of Your Beer
•Adding Oak to Beer

JULY/AUG. 03
•Light Beer Recipes
•Tips for Entering Homebrew Competitions

SEPT. 03
•Pale Ale Recipes
•Yeast Pointers

OCT. 03
•17 Foolproof Extract Recipes
•Trappist Ale Tips & Recipes

NOV. 03
•Choosing and Using Homebrew Pumps
•Steeping vs. Partial Mashing

DEC. 03
•High-Gravity Beers
•Brewing with Spices

JAN./FEB. 04
•Brewing Milk Stout
•3 Mardi Gras Clone Recipes

MAR./APR. 04
•Brewing Sugars & How to use Them
•Yeast: Choose the Right Strain for your Beer

MAY/JUNE 04
•Making Low-Carb Homebrew
•Beer Barbecue Recipes

JULY/AUG. 04
•Brewing Bocks -American & German
•Water Tips for Extract Beer

SEPT. 04
•13 Commercial Hoppy Beers Cloned
•Brewing Old Ales

OCT. 04
•Extract Experiments
•Lambic Brewing

NOV. 04
•4 HomebrewProjects
•Hard Cider Made Easy

JAN./FEB. 05
•Kegging: Nitros, Beer Engines, Refurbishing
•Stout Clones

MAR./APR. 05
•New Hop Varieties
•Grow Your Own Hops

MAY/JUNE 05
•10 Classic Clones: Anchor Steam, Fuller's ESB, Guinness, Sierra Nevada Pale Ale, Orval, Duvel, Paulaner Hefe-Weizen, Pilsner Urquell, Celebrator, Warsteiner

JULY/AUG. 05
•Brewing Heineken and International Lagers
•Belgian Saison

SEPT. 05
•10th Anniversary Issue: 10 Best Wizard Questions
•10 Dark Beer Clones

OCT. 05
•10 Keys to Better Extract Beers
•Brewing Beers with Brettanomyces

NOV. 05
•Build a 3-Tier System
•Converting a Keg to Kettle

DEC. 05
•Pacific Northwest Clones
•10 Hardest Beer Styles

JAN./FEB. 06
•Guide to 133 Yeast Strains
•Building Plastic Mini-Kegs

MAR./APR. 06
•Perfect Pale Ale
•Continuous Hopping Machine

JULY/AUG. 06
•Brewing Hefeweizens
•Belgian Fermentations

SEPT. 06
•Dogfish Head Extreme Recipes
•Brewing Stouts & Porters

OCT. 06
•Guide to 254 Extracts
•Bourbon Barrel Brewing

NOV. 06
•RIMS and HERMS
•All-Star Equipment Set-Ups

DEC. 06
•Double IPA & Double Pilsner Clones
•Doppelbock & Saison

www.brewyourownstore.com

Brew Your Own

Mark your 10 choices below.

BUY 5 GET 5 FREE

Qty.	Issue	Qty.	Issue
____	December 95 (ltd. quantities)	____	Summer 01
____	April 96	____	September 01
____	May 96	____	November 01
____	July 96	____	December 01
____	April 97	____	Jan./Feb. 02
____	August 97	____	Mar./April 02
____	September 97	____	May/June 02
____	October 97	____	July/Aug. 02
____	November 97	____	September 02
____	February 98	____	October 02
____	March 98	____	November 02
____	April 98	____	December 02
____	June 98	____	Jan./Feb. 03
____	July 98	____	Mar./April 03
____	August 98	____	May/June 03
____	October 98	____	July/Aug. 03
____	November 98	____	September 03
____	December 98	____	October 03
____	January 99	____	November 03
____	February 99	____	December 03
____	March 99	____	Jan./Feb. 04
____	April 99	____	Mar./April 04
____	May 99	____	May/June 04
____	June 99	____	July/Aug. 04
____	July 99	____	September 04
____	August 99	____	October 04
____	September 99	____	November 04
____	October 99	____	Jan./Feb. 05
____	November 99	____	Mar. /April 05
____	December 99	____	May/June 05
____	January 00	____	July/Aug. 05
____	February 00	____	September 05
____	March 00	____	October 05
____	April 00	____	November 05
____	May 00	____	December 05
____	Summer 00	____	Jan./Feb. 06
____	October 00	____	Mar./April 06
____	November 00	____	May/June 06
____	December 00	____	July/Aug. 06
____	January 01	____	September 06
____	February 01	____	October 06
____	March 01	____	November 06
____	April 01	____	December 06
____	May 01		

* issues not listed are sold out

5 copies . . . . . .$25 $_____
5 BONUS copies . . . . . .FREE $ FREE
Shipping/Handling . . . . . .$11 $_____
Orders outside the U.S. please call or e-mail for shipping quote.
Beginner's Guide ____ x $6 each = $_____
Best of BYO 150
Classic Clone Recipes____x $6 each= $_____
Homebrewer's Answer Bk.____x $16.95 ea= $_____
BYO Binders ____ x $15 each = $_____
(Binders hold 12 issues each)
Total $_____

Name _____
Address _____
City _____ State ____ Zip _____
E-mail _____
❑ Check Enclosed ❑ MasterCard ❑Visa
Card# _____
Exp. Date _____
Signature _____

MAIL ORDER FORM TO:
BYO Back Issues
5053 Main St., Suite A
Manchester Center, VT 05255

FAX FORM TO:
802-362-2377
or CALL:
802-362-3981

or order online: www.brewyourownstore.com

The ingredients pictured to the left are enough to brew a single six-pack of IPA. (See the recipe on page 34). Brewing beer on a small scale reduces ingredient costs, which can be especially helpful if expensive spices or other ingredients are to be used for the first time. You can test a recipe out and make any needed adjustments before scaling up to a full-sized batch.

small scale BREWING

There is a tendency for some homebrewers to go big. Their enthusiasm for the hobby drives these brewers to build bigger systems that more resemble craft breweries than the kitchen-based efforts that are at their roots. At the same time, other homebrewers are moving in the opposite direction, brewing in smaller batches. Reasons for brewing smaller batches include meeting the demands of limited space, trying out new recipes (especially those with expensive ingredients), conducting experiments or just to brew more often but to produce less beer to store and "dispose" of.

SOMETIMES, THE SOLUTION TO A PROBLEM COMES FROM THINKING SMALL. SMALL SCALE HOMEBREWING HAS MANY ADVANTAGES — YOU BREW MORE OFTEN AND CHEAPLY TRY OUT NEW RECIPES — AND ONE DISADVANTAGE (LESS BEER).

Small Volume = Big Fun

Brett Niland, from Tulsa, Oklahoma, latched onto the small batch concept with a fanatical fervor. In December of 2006, he wrote, "I've been brewing for just a few months now, and in just the last month I have put up three beers, two ciders and have another beer in primary and

MAKING THE MOST OUT OF small batches

By James Spencer

three in secondary. In 5-gallon (19-L) batches, that's roughly 495 bottles. I'm sitting on less than 60 bottles representing various types and styles. I am having an absolute blast."

Small batch brewing fits with Niland's short attention span. "If I were brewing in 5-gallon (19-L) batches, I'd probably be working on my second batch and would not be enjoying the process or the rewards," he wrote.

Since then, Niland writes that he has taken the small batch philosophy to all-grain brewing, converting a 2-gallon (7.6-L) drinking water cooler into a mash tun, using a perforated vinyl tube loop in the bottom as a manifold.

"I've done eight all-grain batches so far and have streamlined the process to the point that I consistently get nine bottles from a 1-gallon (3.8 L) batch," Niland says. "Also, I intend to venture into lagers. Imagine being able to lager beer without the expense and space needed for a beer fridge. Life is sweet!"

Navin Mittal from Mumbai (formerly Bombay), India, jokingly refers to himself as the only homebrewer in his country. Since locating homebrewing ingredients and equipment is difficult, he imports everything that goes into his beers and improvises brewing gear from what he has on hand.

According to Mittal, the price of real estate in Mumbai comes close to what one pays in Manhattan, New York. Space is a precious commodity.

"When I first started out," Mittal says, "the thought of making 5 gallons (19 L) was just crazy. At home, the largest pot we have will hold only about 2 gallons (8 L), and the kitchen is really set up to cook for two to four people. So, I started with making 1.3-gallon (5-L) batches, but that was a bit much, also."

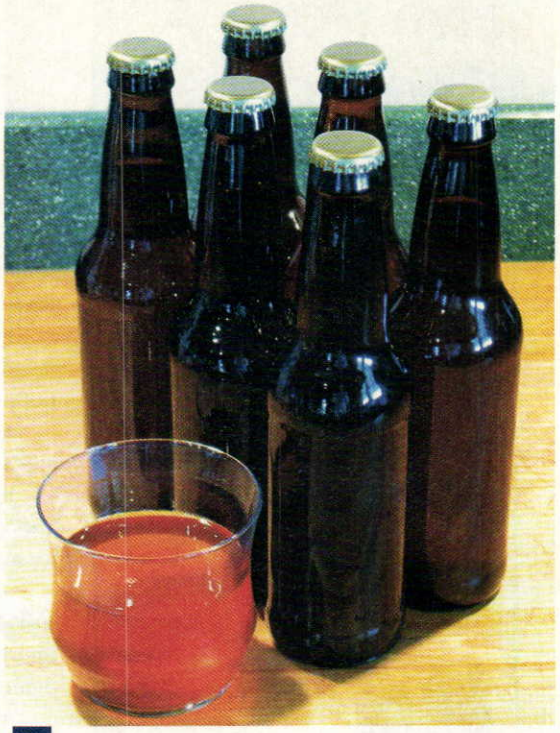
To cope with temperatures that usually hover around 100 °F (38 °C), Mittal ferments in a small refrigerator dedicated to the purpose. "I have done over twenty batches, all-grain, so far, and if it weren't for these smaller batches, I might have given up long ago," he says.

Michael Tonsmeire of Washington, D. C. has been experimenting with small batches since the beginning of his homebrewing career. "When I first started homebrewing, my buddy, Jason, and I would get crazy ideas and just brew a 1-gallon (3.8-L) batch to try them out," Tonsmeire says. "For example, we brewed a peppermint chocolate stout and a persimmon wheat."

For Tonsmeire, the ease of small batch brewing, coupled with the economics, makes the process appealing for trying new things. "Many experimental ingredients that would be cost prohibitive, like exotic spices, or hard to work with on a larger scale, like interesting fruits, are good choices for small batch brewing," he says.

In the same way craft breweries run small pilot batches of beer to formulate recipes, Tonsmeire says homebrewers can run their recipes through a small batch to shake out the bugs before scaling up to full volume. "Small batch brewing is a great way to get familiar with an ingredient you have never used without risking 5 gallons (19 L) of beer on whether or not you will like it."

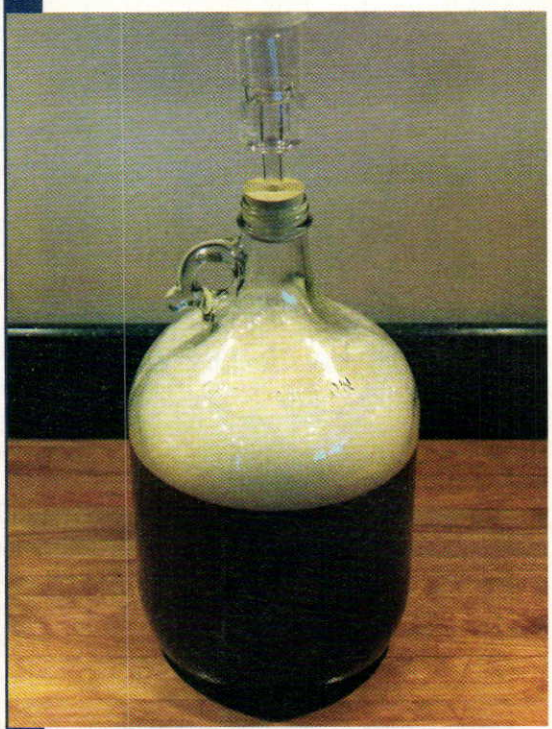
My fascination with small batches started when I was conducting an experiment for Basic Brewing Radio, a podcast I host on the topic of home brewing. There had been some discussion on the podcast about the benefits and potential drawbacks of waiting until near the end of the boil to add any malt extract to an extract brew. So, I decided to conduct a test. I boiled two 1-gallon (3.8-L) batches side-by-side on the stove. In one, I added malt extract and hops at the beginning of the hour-long boil. In the other, I added hops to plain water and waited until the last fifteen minutes to add the extract. My co-host, Steve Wilkes, and I tasted the two samples on the show, which also turned into the first episode of Basic Brewing Video. (We found no off-flavors from boiling the hops in water, but we did find that the hop character and color of the two batches differed considerably.)



Is it a Starter or a Six-Pack?

Many homebrewers use gallon jugs to ferment their yeast starters. For five gallons (19 L) of lager beer, a 1-gallon (3.8-L) yeast starter may be appropriate.

On the other hand, some homebrewers make (at least some of) their beers on a small scale. In the main example used in this article, 3.0 qts. (2.8 L) of beer can be fermented in a 1-gallon (3.8-L) jug (as pictured below) and will yield just over six 12 oz. (355 mL) bottles of beer (as pictured above). Your batches can be scaled to any convenient size.



Five Star Chemical Company

Helping make better beer since 1980

Why lose a batch of beer again!

CLEANERS

★PBW

All-purpose household cleaner

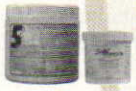
SANITIZERS

★Star San & Saniclean

When you're serious about sanitizing

★Io-Star

Our iodophor



NEW!

ADDITIVES

★5²pH Stabilizer

More consistent brewing

★Super Moss HB

A better Irish Moss

KITS

★Homebrew Cleaning & Sanitizing Kit

ALL you need

Professional brewing products

Available at fine homebrew shops everywhere

Five Star Chemical Company
www.fivestarchemicals.com
1.800.782.7019

ALL products are biodegradable, user and environmentally friendly!

Inspired by the results of the experiment, I decided to take it a step further. On the second episode of Basic Brewing Video, Steve and I brewed up a six-pack of IPA on camera. Listeners and viewers responded to the six-pack episodes very positively. Some wrote to us saying that they didn't realize beer could be brewed in volumes smaller than 5 gallons (19 L).

The same theory can be applied to mead. Twice, Steve Wilkes and I have conducted small batch mead experiments, each beginning with a volume of must or fermented mead that was divided into smaller containers to test different ingredients.

In the first test, Steve and I fermented 6 gallons (23 L) of mead. Then, we divided the mead between six 1-gallon (3.8-L) jugs and added interesting ingredients: ancho chili pepper, blood orange, black cherry, allspice and apricots with saffron.

For the second round, we decided to put five yeast strains to the test to see how they affected a divided must: Narbonne, US 56, Hefeweizen, Trappist Ale and Montrachet.

In each mead experiment, we were able to use an expensive ingredient – honey – in a way that allowed us to preview the effects of various variables on a small scale before we made the commitment to make a full 5 gallons (19 L).

What's Different?

Brewing is basically the same at any scale, but the details of small batch homebrewing differ from "full-scale" homebrewing in a few key ways.

A sensitive scale is needed to measure the quantities of ingredients, since the amounts are smaller and small differences in weighed amounts can have a big impact on the beer. This is especially true when it comes to weighing hops. A scale that can measure to the nearest gram is very useful to a small-scale homebrewer.

If you are a partial mash brewer, brewing small batches, it's easy to formulate your recipes such that most of your extract weight — the fermentable and non-fermentable "stuff" that contributes to your original gravity — comes from mashed grains rather than malt extract. This gives you the flexibility to use a wide variety of base malts as well as fairly large amounts of some starchy adjuncts (such as corn or rice).

Small-scale mashing can easily be done in small pots or beverage coolers. For every 1 gallon (3.8 L) of space you have in your mashing vessel, you can mash 2.0 lbs. (0.91 kg) of grain and collect about 1 gallon (3.8 L) of wort at around 12 °Plato (SG 1.048). The exact volume and wort density you achieve will depend on the grains you mash, how well they are crushed, how much sparge water you use and other variables. Batch sparging or no-sparge procedures work well for smaller batches.

The time to take a small batch of wort up to boiling temperature is shorter than a full-sized batch, obviously. Even on a standard kitchen stove, there is relatively little down time waiting for the mercury to rise. However, this raises the point that since you are boiling a small amount of wort, you may need to watch the boil more carefully to see that the wort isn't scorched or the evaporation rate is too high.

One big benefit for stovetop brewers is that, with batch sizes of 3 gallons (11 L) or less, they can likely perform a vigorous full-wort boil on their stovetop, instead of boiling a thick wort and diluting it later with water. With a full-wort boil, you don't need to worry about your hop utilization limiting the bitterness of your beer or the wort picking up too much color during the boil.

In small batches, wort chilling can be done quickly and simply, without a wort chiller. In a recent brew session, I timed how long it took to chill my wort in an ice bath in my kitchen sink, using around 5 pounds (2.3 kg) of ice. The three quarts (~ 3 L) went from boiling to pitching temperature in around ten minutes. Batches up to 3 gallons (11 L) can be cooled in a sink without too many problems (although it may take an hour or so and require more ice).

Tubes of White Labs liquid yeast and packs of Wyeast liquid yeast contain around 100 billion cells per package. Likewise, an 11 g sachet of dried yeast contains around 110 billions cells. (Note: These numbers are approximate. Cell counts in yeast packages vary and poor handling can significantly decrease the number of healthy cells present.) For 5 gallons (19 L) of moderate-strength (12 °Plato/SG 1.048) ale, the optimal number of yeast cells to pitch is around 260 billion. Thus, for smaller batches, you may be able to

pitch straight from the package and get close to the optimal pitching rate.

Using a yeast pitching calculator can help in determining the proper amount of yeast to pitch. For example, Jamil Zainasheff's "Mr. Malty's Pitching Rate Calculator" (at www.mrmalty.com) indicates that two grams of dried yeast is recommended for 3 quarts (2.8 L) of wort at 1.055 specific gravity and the "Six-Pack Late-Hopped Simcoe Ale" accompanying this story fermented very well with two grams of dried yeast. Again, an good scale is a necessity.

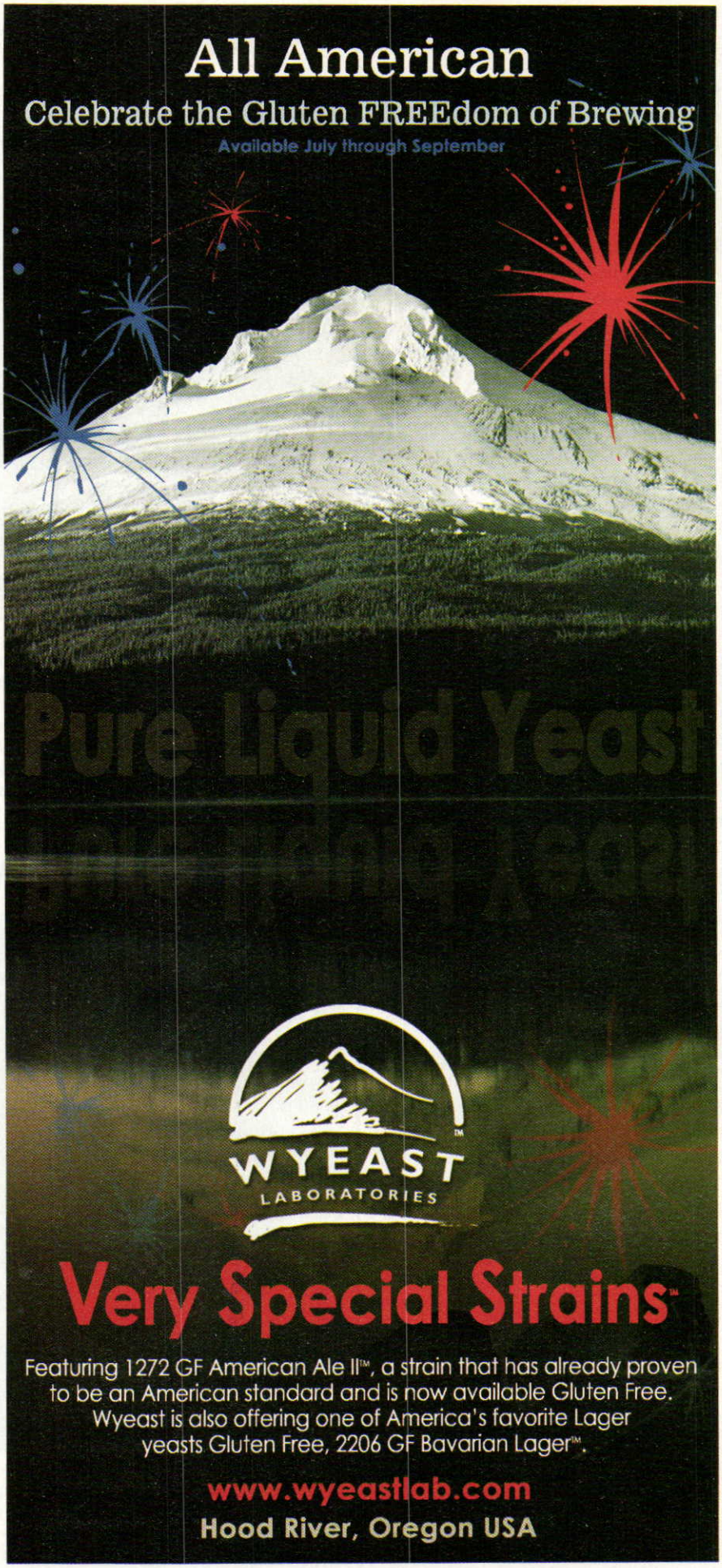
As with a 5-gallon (19-L) batch of homebrew, you can bottle your beer in 12 oz. (355 mL), 16 oz. (473 mL) or 22 oz. (651 mL) bottles. You can also bottle condition in 1 L swing-top "torpedoes" or 2 L "growlers." However, more convenient options are available.

Most homebrew shops sell mini-keg systems, including those based on 5-L (1.3-gallon) aluminum kegs or 6-L (1.6-gallon) plastic (PET) bottles. These mini-kegs are primed with sugar and bottle conditioned like regular homebrew, but dispensed with small CO_2 cartridges (like those used in paintball guns). If you have a standard homebrew kegging system, a 2.5-gallon (9.5-L) or 3-gallon (11-L) Corny keg could be used — if you can find one; they are not as common as the standard 5-gallon (19-L) size.

In priming the beer at bottling time, we choose to prime each bottle instead of adding sugar to the whole batch. To make this process easier, we use Cooper's Carbonation Drops, which are essentially plain sugar "candies" that are designed for the priming process. Muntons makes a product called CarbTabs for the same purpose. Of course, you can also dose each individual bottle using dextrose or sucrose as well, but be very careful in your measurements.

Recipes?

Most homebrew recipes are formulated for 5 gallons (19 L) of beer. To scale a recipe down linearly, just multiply the amount of each ingredient by your batch size, then divide by the batch size specified in the original recipe. For example, if a 5-gallon (19-L) recipe called for 9.0 oz. (0.26 g) of crystal malt. A 3-gallon (11-L) recipe for the same beer would require [9 x 3 / 5 =]



Six-Pack Late-Hopped Simcoe Ale

(3 quarts/3 L, extract w/ grains)

OG = 1.064 FG = 1.016
IBU = 64 SRM = 10 ABV = 6.2%

The ultimate short brew day. From flame-on to cleanup is only 90 minutes. Lots of floral, fruity Simcoe flavor and aroma from the 15-minute boil.

Ingredients

2.0 oz. (60 g) crystal malt (60 °L)
1.0 lb. (0.45 kg) light dried malt extract
4.6 AAU Simcoe hops (15 mins)
(0.35 oz./10 g of 13% alpha acids)
2.0 AAU Simcoe hops (5 mins)
(0.15 oz./4 g of 13% alpha acids)
0.15 oz. (4 g) Simcoe hops (0 mins)
0.15 oz. (4 g) Simcoe hops (dry hop)
2 g Safale US-56 yeast

Step by Step

Crush or mill crystal malt. Bring 1.0 gallon (3.8 L) of water to 150 °F (66 °C). Steep crystal malt in grain bag at around 150 °F (66 °C) for 30 minutes. Remove bag and bring water to boil.

Once water is boiling, add malt extract and 0.35 oz. (10 g) of Simcoe hop pellets. Ten minutes later, add 0.15 oz. (4 g) Simcoe hop pellets. At the end of the 15-minute boil, turn off the heat and add 0.15 oz. (4 g) of Simcoe hop pellets.

Place kettle into ice bath and stir with a sanitized spoon, moving the kettle in the ice and making sure not to get ice water into wort. Check temperature often with a sanitized thermometer. Remove from ice bath when wort reaches 68 °F (20 °C).

Dry the outside of the kettle with a towel to avoid contamination when pouring. Using a sanitized funnel, pour the wort into sanitized 1-gallon (3.8-L) jug, leaving hops and trub behind. Pitch yeast and aerate. Cap off with sanitized stopper and airlock.

When primary fermentation subsides, add 0.15 oz. (4 g) of Simcoe hop pellets for dry hopping. Three days following, chill fermenter jug in refrigerator for 24 hours to clear beer.

Bottle by siphoning from the primary fermenter into bottles. Add priming sugar to each bottle. Bottle condition, chill and enjoy your six pack!

Small-Scale: What You Need

The equipment you need to brew a small-scale batch of homebrew looks a lot like the standard equipment used in extract brewing. A good scale will let you accurately weigh ingredients (especially hops). A refractometer will let you take gravity readings from only a drop or two of wort, rather than needing to fill a hydrometer jar. For partial mash brewers, a small beverage cooler (not pictured) or pot can serve as a mashing and lautering vessel that will supply a significant proportion of the extract weight of the wort. In addition, brewpots, fermenters (carboys) and serving vessels (mini-kegs) are all available in a variety of smaller sizes.

Small-Scale: What to Expect

Small-scale brewing takes a little less time than brewing a "full-sized" batch of homebrew. Although the boil (and mash, if you perform one) will need to be the same length, heating and cooling the wort generally proceeds faster. Likewise, in most cases, packaging of the beer can be done more quickly than bottling the just over two cases of 12 oz. (355 mL) bottles that come from a 5-gallon (19-L) batch of beer.

5.4 oz. (0.15 kg) of crystal malt. Of course, at a smaller scale, you may be boiling more vigorously, boiling your full wort, cooling quicker and doing other things that will affect how the recipe turns out. Take good notes and use these as a guide to making recipe adjustments.

More Toys!

In addition to a good scale for weighing your hops, there are a few other items you may find helpful when scaling down your homebrewing efforts.

With such small quantities, even pulling enough wort to float your hydrometer can put a strain on your yield. A refractometer — an instrument that measures the density of a solution based on the degree it retracts light — only requires a few drops to measure original gravity. For brewing, you need to get a Brix refractometer, the most commonly available kind of which has a scale that covers 0–30 °Brix. As a rough guide, you can consider °Brix the same as °Plato, each degree of which equals roughly four "gravity points" (GP). For example, a 10 °Plato wort has an original gravity of 1.040, or 40 GP.

I have a collection of 1-gallon (3.8-L) glass jugs on hand – usually filled with the latest experiments. Two-gallon (7.6-L) and 3-gallon (11-L) carboys are also fairly common and are great for smaller batches, especially when used as secondary fermenters to minimize or eliminate the amount of headspace in conditioning beer.

Finally, Fermtech now makes an autosiphon that is only 13.5 in. (34 cm) long — perfect for 1-gallon (3.8-L) jugs.

Why Bother?

The most common criticism of small-scale brewing I have found, "If I'm going to put in the work of brewing a batch of beer, I want to brew at least five gallons (19 L)." Obviously, every homebrewer has their own preferences and circumstances. But for those of us with limited space and resources, or a sense of impatient curiosity, small batch brewing can scratch an itch that brewing big can't reach.

James Spencer can be heard every week on Basic Brewing Radio at www.basicbrewing.com. He is also the owner of Active Voicing™, a narration, voiceover, and media production service.

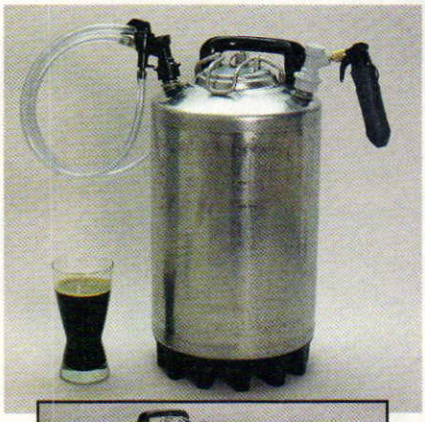
MIDWEST
HOMEBREWING AND WINEMAKING SUPPLIES

Call for our FREE — 76 page New Catalog 1-888-449-2739

2.5 or 3 gallon mini draft system:

Prime with 3 oz. sugar, wait two weeks and your homebrew is ready to serve. A compact CO2 injector uses one 16 gram CO2 cartridge to dispense the beer. Systems include: keg, CO2 Injector, ten 16 gram CO2 cartridges, ball lock gas & liquid fittings, 4 ft. of low foam line and a picnic tap.

Used 2.5 gallon keg system	$109.95
New 2.5 gallon keg system	$134.95
Used 3 gallon keg system	$109.95
New 3 gallon keg system	$139.95



Bring your homebrew any where you want!!!

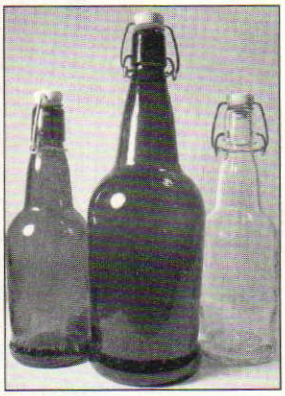
Midwest 3440 Beltline Blvd. Mpls., MN 55416
FAST SHIPPING — www.midwestsupplies.com

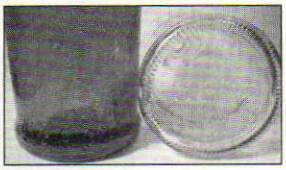
E.Z.Cap

Now our bottles are smooth for easier labelling!

The manufacturer of 16 oz. & 32 oz. flip-top bottles in clear and amber colors

NEW!





The bottles you trust to hold your brew now hold your labels better too!

Smooth Shoulders & Sides-
now the E.Z. Cap logo is on the bottom....
but our bottles are still the tops!

Available to homebrew suppliers through:
L.D. Carlson (330) 678-7733 www.ldcarlson.com
Brewcraft USA (503) 281-3941 www.brewcraftusa.com

Manufactured by: E.Z. Cap (403) 282-5972 www.ezcap.net

15 Summertime

by **Betsy Parks**

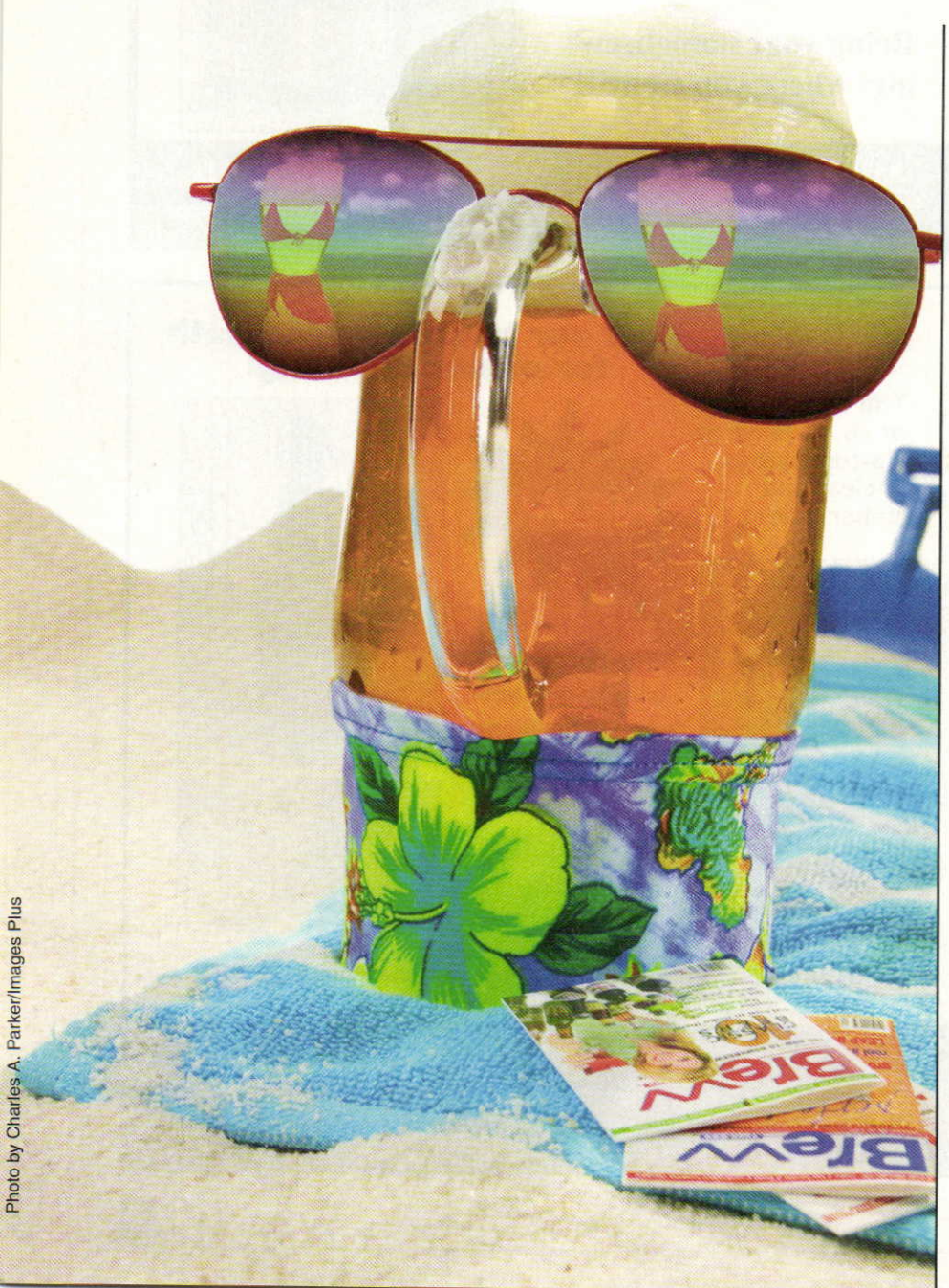


Photo by Charles A. Parker/Images Plus

Most of us don't need an excuse to celebrate summer weather. Brewfests and competitions abound, family reunions are planned and backyard parties pop up — even wardrobes get the special treatment with short sleeves and sandals. So why not brew something that tastes great at the beach or barbecue, a thirst-quencher that goes down great after a day of gardening or while grilling?

Summer brewing doesn't differ that much from brewing during the other seasons. You may slap a few more mosquitoes while mashing, but the biggest difference comes when it's time to chill your wort and maintain your fermentation temperature. When making a summer brew, make sure to check the temperature of your chilled wort (with a sanitized thermometer). As your tap water is likely warmer in the summer, you may need to add a few more ice cubes to your water bath to cool your wort down to proper fermentation temperatures. Likewise, higher outside temperatures means your usual "cool spot" in the house may be too warm for fermenting.

Try one of these tried and true seasonal recipes from homebrew shops across the country. (BYO calculated the brewing statistics, such as OG and IBU.) Or, use them as inspiration for designing your own summer sipper. In this collection, we present a beach-ready golden ale from the U.S. Gulf Coast, a Mexican lager from California (lime optional), a crisp rye pale ale from Vancouver and many more. Feeling refreshed yet?

DeFalco's Golden Ale

DeFalco's Home Wine & Beer Supplies
Houston, Texas
www.defalcos.com

(5 gallons/19 L, extract with grains)
OG = 1.047 FG = 1.011
IBU = 23 SRM = 5 ABV = 4.6%

It's so bloody hot on the Gulf Coast, this summer recipe is popular pretty much year 'round.

Ingredients

6.0 lbs. (2.7 kg) Alexander's Pale liquid malt extract
(or 5.0 lbs. (2.3 kg) Muntons Extra Light dried malt extract)
1 lb. (0.45 kg) domestic two-row pale malt
0.5 lb. (0.23 kg) CaraPils® malt
6 AAU Cascade hops (45 mins)
(1.0 oz./28 g of 6% alpha acid)
2.25 AAU Liberty hops (10 mins)
(0.5 oz./14.2 g of 4.5% alpha acid)
2.25 AAU Liberty hops (0 mins)
(0.5 oz./14.2 g of 4.5% alpha acid)
1 pkg. Burton water salts
1 pkg. Nottingham Ale or Wyeast 1056 (American Ale), 1007 (German Ale), White Labs WLP001 (California Ale) or WLP 029 (German Ale) yeast.
1 pkg. Bru-Vigor
0.75 cup corn sugar (for priming)

Step by Step

In a small saucepan, bring a gallon (3.8 L) of water to 160–170 °F (71–77 °C). Add the bag of grains and water salts and steep 30 minutes. Now, gently sparge (rinse) the grains with hot tap water (ideal temperature 168 °F/76 °C) and bring the total volume up to two or more gallons in your brewpot. Bring to boil.

Turn off heat and add malt extract. Return to boil, add the hops at the times specified in the ingredient list. Add the last does of Liberty hops and immediately turn off heat. Let stand for 20-30 minutes in a cooling bath. Pour the cooled wort into the fermenter. Bring the volume up to five gallons (19 L). If the temperature is less than 80 °F (27 °C), pitch the yeast and the packet of Bru-Vigor (if using) into the wort and place the lid and airlock over the fermenter. Ferment at 65–70 °F (18–24 °C). After fermentation, check the specific gravity. The F.G. should be 1.011 or less. If it is higher than 1.016, allow to ferment and settle for a few more days. Prime and bottle. Allow beer to age at room temperature for at least two weeks. Peak flavor is reached after six weeks.

All-grain option:

Substitute eight pounds (3.6 kg) of pale malt for the malt extract.

Pendulum Swinger Light Ale

Somethings Brewn'
Galesburg, Illinois
www.somethingsbrewn.com

(5 gallons/19 L, extract with grain)
OG = 1.048 FG = 1.012
IBU = 27 SRM = 5 ABV = 4.7%

A couple from one of the local homebrew clubs sent out a call to the club members to provide homebrew for their upcoming wedding reception. A couple of hours into their reception, the keg of Pendulum Swinger Light Ale had already blown!

Ingredients:

3.5 lbs. (1.6 kg) Bierkeller Light liquid malt extract
2.0 lbs. (0.91 kg) Muntons Extra Light dried malt extract
1.0 lb. (0.45 kg) Pilsen malt
0.5 lbs. (0.23 kg) CaraPils® malt
3.7 AAU Saaz hop pellets (60 minutes)
(1.0 oz/28 g of 3.7% alpha acids)
4.1 AAU Tettnang hops (15 mins)
(1.0 oz./28 g of 4.1% alpha acids)
1.65 AAU Hersbrucker hops (15 mins)
(0.5 oz./14 g of 3.3% alpha acids)
1.65 AAU Hersbrucker hops (5 mins)
(0.5 oz./14 g at 3.30 alpha acids)
White Labs WLP029 (German Ale/ Kölsch) yeast
0.75 cups corn sugar (for priming)

Step by Step

Place crushed grains in a steeping bag and add to one and a half gallons (5.7 L) of water warmed to 160 °F (71 °C). Let steep for 45 minutes between 152–157 °F (67–69 °C). Slowly rinse grain bag with one gallon (3.8 L) of 170 °F (77 °C) water into your boiling pot. Add more water to a total of 5.5 gallons (21 L) or whatever your pot will comfortably hold without boiling over.

Once water comes to boil, remove from heat and add your malt extracts. Bring back to boil. Use a hop bag for each hop addition. Add boiling hops. With fifteen minutes left in boil add the flavoring hops. With five minutes left in boil add the aroma hops. After 60 minutes total boil time, remove pot from heat and take out the three hop bags. Cool wort, transfer to a fermenter and aerate. Pitch yeast. Ferment at 64 °F (18 °C).

Michigan Summer Wheat Ale

Siciliano's Market
Grand Rapids, Michigan
www.sicilianosmkt.com

(5 gallons/19 L, all-grain)
OG = 1.048 FG = 1.012
IBU = 29 SRM = 8 ABV = 4.7

Many Siciliano's customers regularly request a recipe for a "Michigan" style wheat ale.

Ingredients:

4.0 lbs. (1.8 kg) American wheat malt
3.0 lbs. (1.4 kg) American Pilsen malt
2.0 lbs. (0.9 kg) American Vienna malt
8 oz. (227 g) American crystal malt (10 °L)
8 oz. (227 g) American CaraPils® malt
4.25 AAU Mt. Hood hops (60 mins)
(1.0 oz./28 g of 4.25% alpha acids)
4.25 AAU Mt. Hood hops (20 mins)
(1 oz./28 g of 4.25% alpha acids)
1 oz. (28 g) Mt. Hood hops (5 mins)
1 tsp. Irish moss (15 mins)
1 tsp crushed coriander seed (5 mins)
Fermentis SafBrew S -33 yeast
0.75 cups corn sugar (for priming)

Step by Step

Mash at 152 °F (67 °C) in 1.15 quarts (1.1 L) of water per lb. (kg) of grain. Sparge and collect 7.0 gallons (26 L) for a 60-minute vigorous boil. Ferment at 70 °F (21 °C) to enhance yeast profile.

Michigan Summer Wheat Ale

Siciliano's Market
Grand Rapids, Michigan
www.sicilianosmkt.com

RECIPES

(5 gallons/19 L, extract with grains)
OG = 1.054 FG = 1.013
IBU = 28 SRM = 4+ ABV = 5.2

Ingredients

5.5 lbs. (2.5 kg) Briess wheat dry malt extract
8 oz. (227 g) American CaraPils® malt
8 oz (227 g) American 10 L crystal malt
4.25 AAU Mt. Hood hops (60 mins) (1.0 oz./28 g of 4.25% alpha acids)
4.25 AAU Mt. Hood hops (20 mins) (1 oz./28 g of 4.25% alpha acids)
1 oz. (28 g) Mt. Hood hops (5 mins)
1 tsp. Irish moss (15 mins)
1 tsp crushed coriander seed (5 mins)
Fermentis SafBrew S - 33 yeast
0.75 cups corn sugar (for priming)

Step by Step:

In a small pot, heat two gallons of water (7.6 L) to 160 °F (71 °C). In a steeping bag, add specialty grains and steep 20 minutes. Remove grain sock, add one gallon of water (3.8 L) and bring to a boil for 60 minutes. Add 3 lbs. (1.4 kg) dried malt extract (DME) at beginning of boil and hops as indicated. Add rest of DME last 20 minutes of the boil, additives as indicated. Rapidly chill wort after boil. Ferment at 70 °F (21 °C) to enhance yeast profile.

Grande Mexican Lager

William's Brewing
San Leandro, California
www.williamsbrewing.com

(5 Gallons/19 L, all-grain)
OG = 1.071 FG = 1.018
IBU = 36 SRM = 6 ABV = 6.9%

"Grande" was designed by Randy Guerrero, an employee of William's Brewing in San Leandro, California to accompany the setting summer sun.

Ingredients

13.15 lbs. (6.1 kg) U.S. two-row pale malt
1.25 lbs. (0.6 kg) flaked corn
0.5 lb. (.23 kg) CaraPils® malt
4.5 AAU Hallertauer hops (55 mins) (1.0 oz./28 g of 4.5% alpha acids)
6 AAU Saaz hops (30 mins) (1.5 oz./43 g of 4% alpha acids)
4 AAU Saaz hops (10 mins) (1.0 oz./28 g of 4% AAU)
Wyeast 2042 (Danish Lager) yeast
0.75 cups corn sugar (for priming)

Step by Step

Boil time is 60 minutes. Ferment for 14 days at 50 °F (10 °C), then transfer and lager for 4 weeks at 40 °F (4.4 °C).

Extract option:

Substitute 10 lbs. (4.5 kg) William's American Light liquid malt extract.

95 in the Shade

William's Brewing
San Leandro, California
www.williamsbrewing.com

(5 gallons/19 L, extract only)
OG = 1.040 FG = 1.010
IBU = 20 SRM = 4+ ABV = 3.8%

This light ale is designed to quench the thirst on the hottest of days.

Ingredients

6 lbs. (2.7 kg) William's German Pilsner malt extract
4.5 AAU Hallertau hops (55 mins) (1.0 oz./28 g of 4.5% alpha acids)
4.5 AAU Hallertau hops (5 mins) (1 oz./28.3 g of 4.5% alpha acids)
Wyeast 1187 (Ringwood Ale) yeast
0.75 cups corn sugar (for priming)

Step by Step

Ferment for 14 days at 68 °F (20 °C).

All-grain option:

Substitute 8 lbs. (3.6 kg) German Moravian 2-row malt and 0.5 lb. (0.23 kg) German Vienna malt.

Rye Pale Ale

Bader Beer & Wine Supply & Bader Winery
Vancouver, Washington
www.baderbrewing.com

(5 gallons/19 L, extract with grains)
OG = 1.050 FG = 1.013
IBU = 58 SRM = 10 ABV = 4.9%

The dry, crisp flavor of rye malt and relatively high IBUs make this beer that quite refreshing.

Ingredients

3.3 lbs. (1.5 kg) Coopers Light liquid malt extract
2.0 lbs. (0.9 kg) Coopers Light dried malt extract
1.0 lb. (0.45 kg) rye malt
1.0 lb. (0.45 kg) Munich malt (10 °L)
0.5 lb. (0.23 kg) Victory malt
6.0 oz. (170 g) honey malt
10.5 AAU Magnum hops (60 mins) (0.75 oz./21 g of 14% alpha acids)
3.75 AAU Fuggle hops (30 mins) (0.75 oz./21 g of 5% alpha acids)
2.5 AAU Kent Golding hops (20 mins) (0.5 oz./14 g of 5% alpha acids)
2.5 AAU Kent Golding hops (10 mins) (0.5 oz./14 g of 5% alpha acids)
1.0 oz. (28 g) Fuggle hops (0 mins)
2.0 oz. (57 g) Amarillo hops (dry hop)
1.0 tsp. Irish moss (15 mins)
White Labs WLP051 (California Ale V) or Wyeast 1332 (Northwest Ale) yeast
0.75 cups corn sugar (for priming)

Step by Step

Steep crushed malted grain in 2 gallons (7.6 L) of 150 °F (66 °C) water for 30 minutes. Remove the grains, then bring water to a boil. When boiling starts, stir in the malt syrup. Return to a boil, adding hops at times specified in ingredient list. Fill your sanitized carboy with 2 gallons (7.6 L) of cold water. Strain the hot wort into the carboy and top off to the 5.25-gallon (20-L) mark. Add yeast when beer is less than 78 °F (26 °C) and ferment. Add the dry hops when the beer is done fermenting. Remove the dry hops after about four days. Bottle your beer, age for 2–3 weeks and enjoy!

Mo's Summer Ale

Great Fermentations
Indianapolis, Indiana
www.greatfermentations.com

(5 gallons/19 L, all-grain)
OG = 1.055 FG = 1.014
IBU = 24 SRM = 5+ ABV = 5.4%

Ingredients

10 lbs. (4.5 kg) 2-row pale malt
0.25 lb. (0.11 kg) CaraPils® malt
0.25 lb. (0.11 kg) wheat malt
1.0 lb. (0.45 kg) flaked rice
4.5 AAU Hallertau hops (60 mins) (1.0 oz./28 g of 4.5% alpha acids)
2.25 AAU Liberty hops (30 mins) (0.5 oz./14 g of 4.5% alpha acids)
2 AAU crystal hops (5 mins) (0.5 oz./14 g of 4% alpha acids)
0.5 oz (14 g) lemongrass
0.5 oz (14 g) lavender
0.5 oz. (14 g) chamomile
Wyeast 1332 (Northwest Ale) yeast
0.75 cups corn sugar (for priming)

Step by Step

Mash at 152 °F (67 °C) for 60 minutes. Add lemongrass, lavender and chamomile to the secondary fermentation.

Extract option:
Substitute 6.4 lbs. (2.9 kg) dry malt extract for 10 lbs. two-row pale malt.

Apricot Harvest Wit

Ben's Homebrew
Tarentum, Pennsylvania
www.benshomebrew.com

(5 gallons/19 L, extract)
OG = 1.054 FG = 1.014
IBU = 30 SRM = 3+ ABV = 5.2%

This is a light, crisp and wonderfully delicious beer Ben Knoerdel made for his wife who doesn't like hoppy beer.

Ingredients

6 lbs. (2.7 kg) Briess Bavarian Wheat dried malt extract
8 AAU Saaz hops (45 mins) (2 oz./57 g of 4% alpha acids)
2 tsp. crushed coriander
0.5 oz (14 g) bitter orange peel
1 can Oregon apricot fruit puree
White Labs WLP400 (Belgian Wit Ale) yeast

Step by Step

Add 2.5 gallons (9.5 L) of cool water to your kettle and add the wheat malt extract. Bring to a boil and add 2 oz. (57 g) of Saaz hops. Boil for 45 minutes and add crushed coriander and bitter orange peel. Boil for 15 minutes. Cool wort and siphon to fermenter. Top up to five gallons (19 L), aerate and pitch yeast. Wait seven days then transfer to secondary and the can of Oregon apricot fruit puree. Wait five to seven days and bottle.

All-grain option:
Replace DME with 6.0 lbs (2.7 kg) Briess two-row malt and 3.75 lbs. (1.7 kg) wheat malt. Mash with 3.0 gallons (11 L) of water at 152 °F (67 °C) for 60 minutes. Batch sparge with 4.8 gallons (18 L) of water and collect a total of 6.5 gallons (25 L) of wort.

California Common Shoreline Steamer

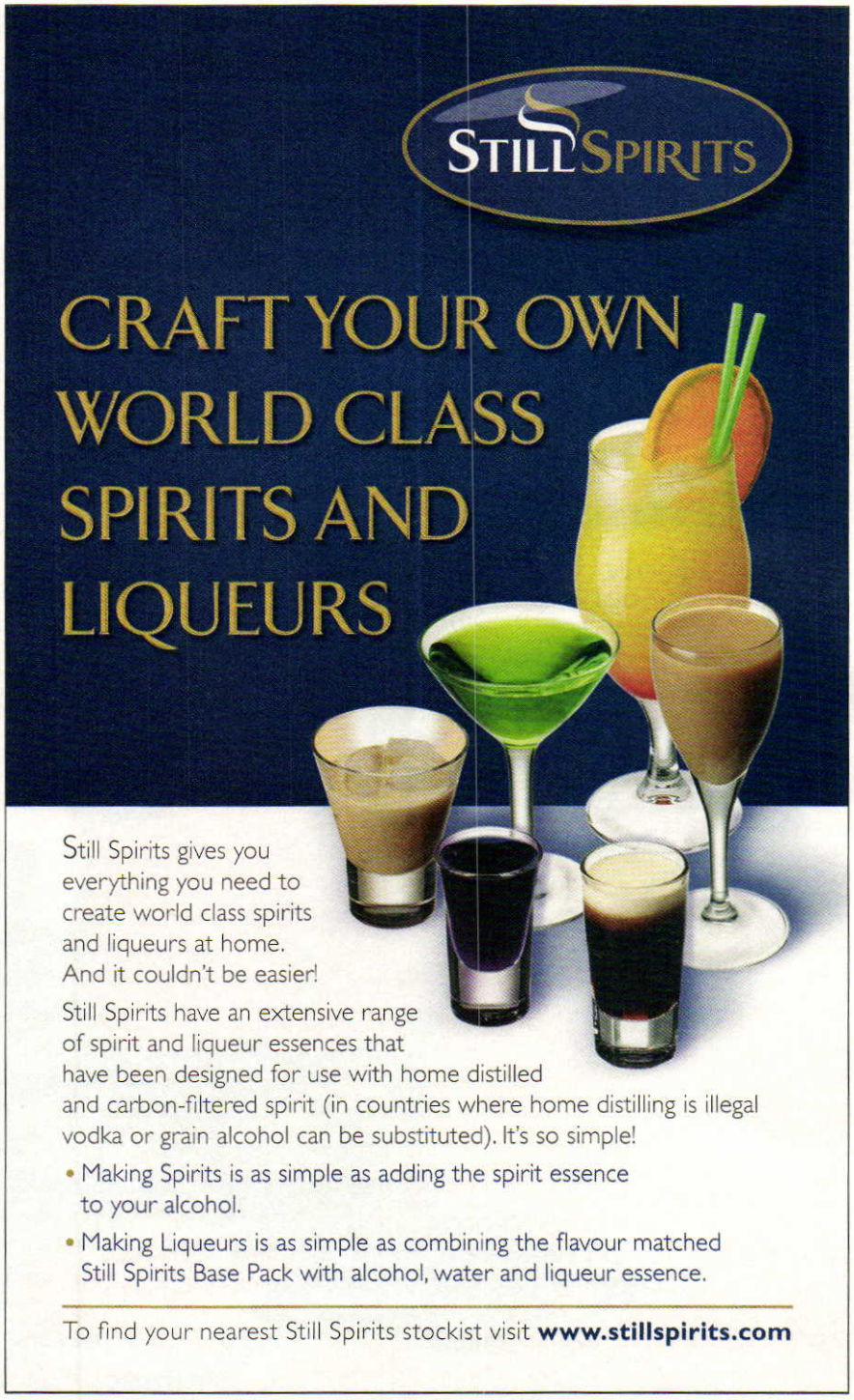
The Cellar Homebrew
Seattle, Washington
www.cellar-homebrew.com

(5 gallons/19 L, extract with grains)
OG = 1.072 FG = 1.018
IBU = 74 SRM = 16 ABV = 7.0%

Ingredients

6.0 lbs. (2.7 kg) Briess light liquid malt extract
3.0 lbs. (1.4 kg) Briess light dried malt extract
0.75 lb. (.34 kg) English crystal malt (70–80 °L)
0.5 lb. (0.23) German light crystal malt
6 AAU Cascade hops (60 mins) (1.0 oz./28 g of 6% alpha acids)
12 AAU Chinook hops (60 mins) (1.0 oz./28 g of 12% alpha acids)
1 oz. (28 g) Cascade hops (5 mins)
1 oz. (28 g) Chinook hops (5 mins)
Cooper's dried or Wyeast 2112 (California Lager) yeast
0.75 cups corn sugar (for priming)

Step by Step



Place the crushed grains into two strainer bags. If using leaf hops, place the boiling and finishing hops in separate bags. Pellet hops need not be placed in bags, as they will not be strained out later. Pour 2.5 gallons (9.5 L) of water into the kettle. Add the grain bags to your kettle and bring the water almost to a boil. Remove the kettle from heat and let it sit for 10 minutes.

Carefully remove the grain bags and place them into a strainer over the kettle. Rinse the grain bags with one quart of hot water into the kettle and dispose of the spent grains. Add the malt extract to the kettle and stir until it is completely dissolved. Place the kettle back on the burner and bring it to a boil.

Once a vigorous boil has been achieved, add the boiling hops. Time the boil for one hour from this point. After 55 minutes of boiling, add the finishing hops. Let the boil continue for five minutes then remove the kettle from heat. Cover the kettle and let it cool for 20 minutes before continuing. If using leaf hops, carefully remove the hop bags from the kettle and place them in a strainer over the fermenter. Pour 2.5 gallons (9.5 L) of very cold water into the fermenter (pour this over any leaf hops to rinse them.) Add the contents of the kettle to the cold water in the fermenter. Top up the fermenter to 1 inch (2.5 cm) over the 5 gallon (19 L) mark with cold water.

All-grain option:

Your grain bill is 11.5 lbs. (5.2 kg) US two-row malt and 0.75 lbs. (0.34 kg) English crystal malt (70–80 °L).

Garden Wedding Cream Ale

The Beverage People
Santa Rosa, California
www.thebeveragepeople.com

(5 gallons, 19 L, partial mash)
OG = 1.061 FG = 1.015
IBU = 25 SRM = 5 ABV = 5.9%

Ingredients

5 lbs. (2.3 kg) Briess Light dried malt extract
1.0 lb. (0.45 kg) 6-row pale malt
0.5 lb. (0.23 kg) CaraPils® malt
1.0 lb. (0.45) flaked maize (corn)
1.0 lb. (0.45) dried rice extract
1/3 tsp. gypsum
1/8 tsp. calcium chloride
1 tsp. Irish moss
3.8 AAU Perle hop pellets (60 mins) (0.5 oz./14 g of 7.5% alpha acids)
4 AAU Hallertau hops (30 mins) (1.0 oz./28 g of 4% alpha acids)
Wyeast 1056 (American Ale) or White Labs WLP002 (English Ale) yeast
0.75 cups corn sugar (for priming)

Step by Step

Mash grains, except CaraPils®, including flaked maize and rice extract, together at 150 °F (66 °C) for 60 minutes. Add CaraPils® for last 15 or 20 minutes of mash. Bring to a boil, adding hops as indicated above. Warm or cool fermentation, depending on desired fruitiness. Cold conditioning optional.

All-grain option:

Your grain bill is 5.0 lbs. (2.3 kg) two-row malt, 2.0 lbs. (0.91 kg) six-row malt, 0.5 lb. (0.23 kg) CaraPils® malt, 1.0 lb. (0.45 kg) flaked maize (corn), 1.0 lb. (0.45 kg) dried rice extract. Mash grains, except CaraPils®, including flaked maize and rice extract, together at 150 °F (66 °C). for 60 minutes. Add CaraPils® for last 15 or 20 minutes of mash. Use a 90-minute boil, adding hops as indicated above. Warm or cool fermentation, depending on desired fruitiness. Cold conditioning optional.

Good Brewer Hefeweizen

The Good Brewer
Livermore, California
www.goodbrewer.com

(5 gallons/19 L, extract with grains)
OG = 1.061 FG = 1.015
IBU = 16 SRM = 5+ ABV = 5.9%
Although "bigger" than BJCP guidelines would suggest, this hefe's extra kick is eased by crystal hops and Weihenstephan yeast.

Ingredients

6 lbs. (2.7 kg) Briess wheat dried malt extract
12 oz. (.34 g) wheat malt
4.0 oz. (113 g) crystal malt (10 °L)
4.0 oz. (113 g) CaraPils® malt
4.0 oz. (113 g) flaked wheat
3.0 AAU crystal hops (60 mins)

Web extra:

For three additional summer recipes, check us out online.

www.byo.com

(1.0 oz./28g of 3% alpha acids)
2.25 AAU crystal hops (20 mins)
(0.75 oz./21 g of 3% alpha acids)
1 oz. (28 g) Czech Saaz pellets (0 mins)
2 tsp. Irish moss
½ C. maltodextrin
2 tsp. citric acid or fresh lemon or orange
Wyeast 3068 (Weihenstephan Weizen) yeast
0.75 cups corn sugar (for priming)
1.0 oz. (28 g) heading powder (optional for extra head retention)

Step by Step

Place all grains in a grain bag in the boil kettle. Water should be at 150–155 °F (66–68 °C). Turn off heat and steep for 30 minutes. Remove grains from kettle and slowly add wheat drid malt extract (DME) to kettle while stirring. Once DME is dissolved, return kettle to heat and bring to a boil.

Make first hop addition at beginning of boil. Total boil time is 60 minutes. With 20 minutes left, add the second crystal hops, two tsp. Irish moss, ½ C. maltodextrin and 2 tsp citric acid or fresh lemon or orange.

Make final hop addition at the end of the boil and turn off the heat. Cool wort to 70–75 °F (21–24 °C), pitch yeast and aerate well. Consider using a blow off tube as this is a pretty aggressive fermenter.

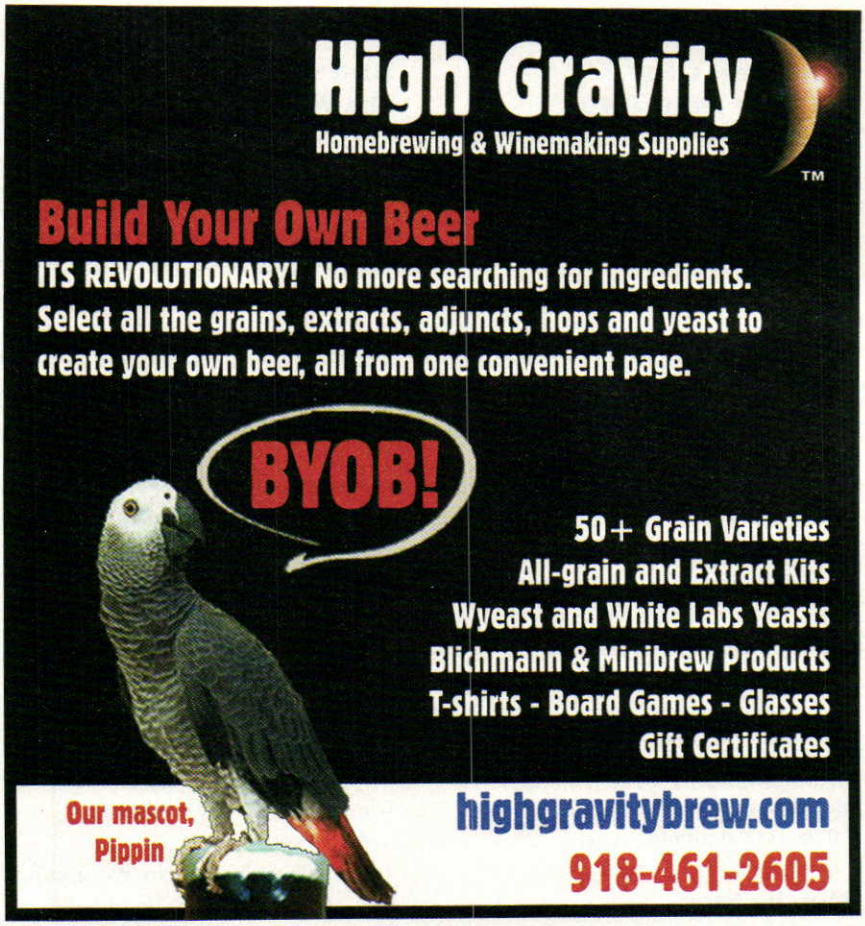
Ferment one to two weeks and rack off into secondary for an additional week. At bottling time, use 2/3 cup corn sugar, and 1 oz. (28 g) of heading powder if you want some extra head retention. Condition for three weeks and enjoy!

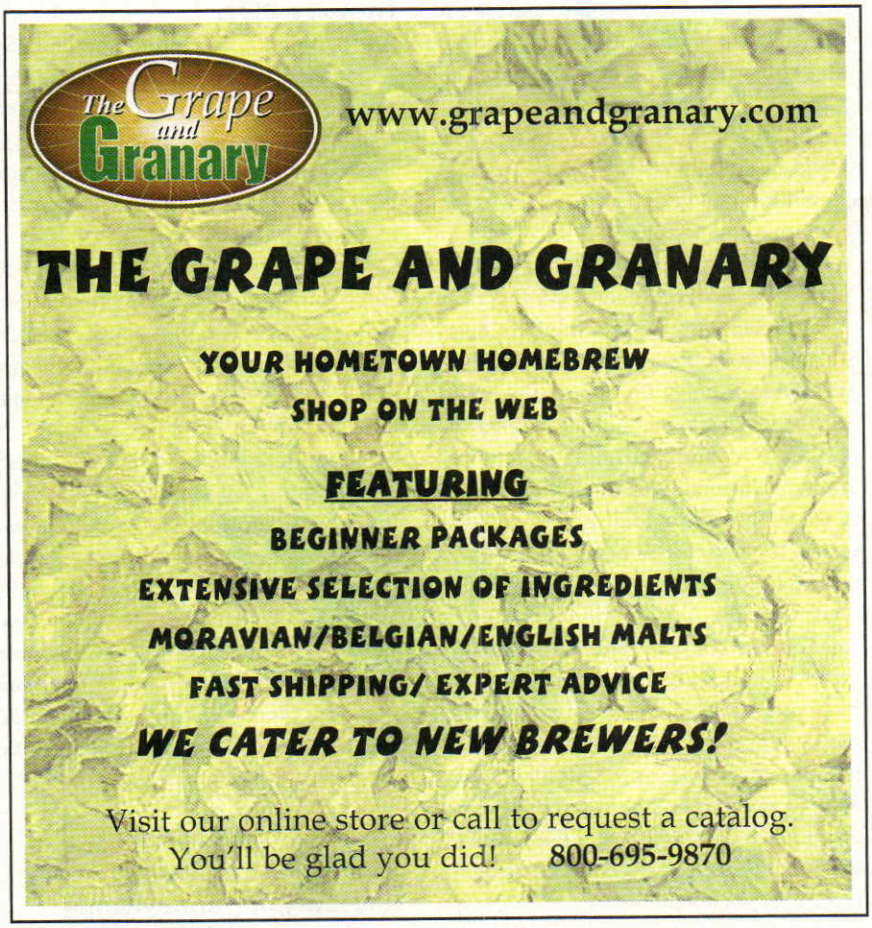
All-grain option:

Your grain bill is 7.5 lbs. (3.4 kg) wheat malt, 3.5 lbs. (1.6 kg) Pilsner two-row malt, 0.5 lbs. (0.23 kg) flaked wheat and 0.375 lbs. (0.17 kg) crystal malt (10 °L). Mash water volume is 3.5 gallons (13 L). Mash temperature: 145-150 °F (63-66 °C), mash for 60 minutes, ensure starch has been converted.

Sparge with hot water at 170 °F (77 °C) and collect 5.5 gallons (21 L) of wort. Boil for 60 minutes, adding hops at times indicated in ingredients. Cool wort, transfer to fermenter and pitch yeast.

Ferment for one to two weeks and rack to the secondary for a week. Bottle and prime with corn sugar.





Redhead CPA (Cherry Pale Ale)

Homebrew Pro Shoppe, Inc.
Olathe, Kansas
www.brewcat.com

(5 gallons, 19 L, extract with grains)
OG = 1.046 FG = 1.011
IBU = 21 SRM = 21 ABV = 4.4%

Many of our customers are looking for a "new brew" that's a bit different . . . and it turns out that our fruit ale has become quite popular.

Ingredients

6.6 lb. (3.0 kg) Briess Golden light liquid malt extract
8.0 oz. (0.23 kg) crystal malt (60 °L)
4.5 AAU Hallertau hops (bittering) (1.0 oz./28 g of 4.5% alpha acids)
6 AAU Cascade hops (finishing) (1.0 oz./28 g of 6% alpha acids)
4.0 oz. (113 g) cherry flavor extract (3 lbs./1.4 g of cherry fruit puree can be substituted for a fruitier finish)
Muntons Ale yeast
5.0 oz. (142 g) priming sugar

Step by Step

Pour two gallons (7.6 L) of clean water into a 4-gallon (15-L) or larger pot. Pour crushed grains into the cloth bag and tie the end into a knot to close it. Place the grain filled bag into the brew pot water and heat to approximately 160–170 °F (71–77 °C). Remove the grain bag and allow it to drain into the brew pot without squeezing and discard.

Heat the brew pot water to boiling. Remove kettle from heat. Add the malt extract syrup. Stir well and return to heat. Stir constantly until it returns to a boil. Add bittering hops. Do not use the kettle lid. Boil for 55 minutes, stirring occasionally, then add finishing hops. Boil for an additional five minutes (total boiling time is 60 minutes). You will add the flavor extract to taste just prior to bottling (add optional puree to the primary fermentation). Cool the wort rapidly to 70 °F (21 °C). Pour the brewpot contents into a sanitized 6.5-gallon (25-L) food grade plastic fermenter. With the cooled wort in the plastic fermenter, add 70 °F (21 °C) water until the level reaches the 5-gallon (19-L) mark on the bucket. Sprinkle the contents of the yeast packet on top of the wort and stir well. Place the fermenter in a 68–72 °F (20–22 °C) environment.

Bee Hive Blonde Ale

The Winemaker Shop
Fort Worth, Texas
www.winemakershop.com

(5 gallons/19 L, extract with grains)
OG = 1.055 FG = 1.014
IBU = 23 SRM = 7+ ABV = 5.3%

This is one of our custom store kits that is very popular in the summertime. It is kind of a cross between an American Pale Ale and a Blonde Ale. The Summit hops at the end of the boil gives the beer a very pleasant citrus aroma.

Ingredients

6.0 lbs. (2.7 kg) Briess Pilsen light liquid malt extract
0.5 lbs. (.23 kg) honey malt
2.0 lbs. (0.9 kg) honey
4.1 AAU Mt. Hood hops (60 mins) (0.75 oz./21 g at 5.5% alpha acids)
4.5 AAU Summit hops (15 mins) (0.25 oz./7 g at 18% alpha acids)
1.0 oz. (28 g) Summit hops (0 mins)
White Labs WLP051 (California Ale V) yeast
1 Whirlfloc tablet or 1 tsp Irish moss
5 oz. (142 g) corn sugar (for priming)

Step by Step

Add 2 gallons (7.6 L) filtered water to boiling pot. Add grain bag to water and heat water to 155–160 °F (68–71 °C). Let rest for 30 minutes. Remove grain bag and add extracts and honey. Stir extract until completely dissolved, then add filtered water to make 6.5 gallons (25 L).

Heat wort to boiling, then add Mt. Hood hops. Boil for 45 minutes. Add Whirlfloc tablet or Irish moss. Add first addition of Summit hops. Boil 15 more minutes, add second edition of Summit hops and turn off heat.

Remove from heat, stir for several minutes (this will cause the solids to settle in the middle of the pot). Cool wort down to 75 °F (24 °C) and transfer to fermenter. Aereate wort, then add yeast. Ferment until final gravity (FG) is less then 1.010. Mix corn sugar with 1 cup water, bring to boil, and then cool to room temperature. Transfer beer to bottling bucket, add corn sugar solution. Bottle condition for at least two weeks.

South Hills Brewing Supply Blonde Ale

Pittsburgh, Pennsylvania
www.southhillsbrewing.com

(5 gallons/19 L, extract with grains)
OG = 1.042 FG = 1.011
IBU = 7 SRM = 3+ ABV = 4.1%

Ingredients

3.0 lb. (1.4 kg) extra light dried malt extract
1.0 lb. (0.45 kg) rice syrup solids
1.0 lb. (0.45 kg) light honey
1.75 AAU Mt. Hood hops (30 mins) (0.3 oz./8.5 g of 5.5% alpha acids)
2.75 AAU Mt. Hood hops (0 mins) (0.5 oz./14 g of 5.5% alpha acids)
1 tsp. yeast nutrient
1 Whirlfloc tablet
White Labs WLP029 (German Ale/Kölsch) yeast

Step by Step

Add bittering hops to 1.5 gallons (5.7 L) of water, bring to a boil for 30 minutes and remove from heat. Add malt and rice extracts and stir until thoroughly dissolved. Bring to a light simmer and maintain for 15 minutes.

Add one teaspoon of yeast nutrient and the Whirlfloc tablet (this aids in clarity) along with the finishing hops and honey. Continue simmering for another 10 minutes. Cool with the aid of a wort chiller to a temperature of 70–80 °F (21–27 °C).

Add to plastic fermenter with 3 gallons (11 L) of room temperature water. Alternatively, cover pot and chill in an ice water bath for 15–20 minutes. Add to fermenter and top up with 3 gallons (11 L) of cold water. Pitch yeast and ferment for a week to ten days. Transfer to a glass carboy and ferment until completion. Prime, bottle, and age for three weeks or more.

Kepler's Kölsch

***Brew Your Own* magazine**

(5 gallons/19 L, countertop partial mash)
OG = 1.047 FG = 1.009
IBU = 22 SRM = 6 ABV = 4.9%

Kölsch is a tricky beer style to pull off. Some would say that stovetop extract brewers shouldn't even think about trying it. Not us. We know that if you take a scientific approach you can do it. However, you need to read these instructions carefully before you brew and follow them exactly.

Ingredients

3.0 lbs. (1.4 kg) Pilsner malt
0.5 lbs. (0.23 kg) Vienna malt
0.5 lbs. (0.23 kg) wheat malt

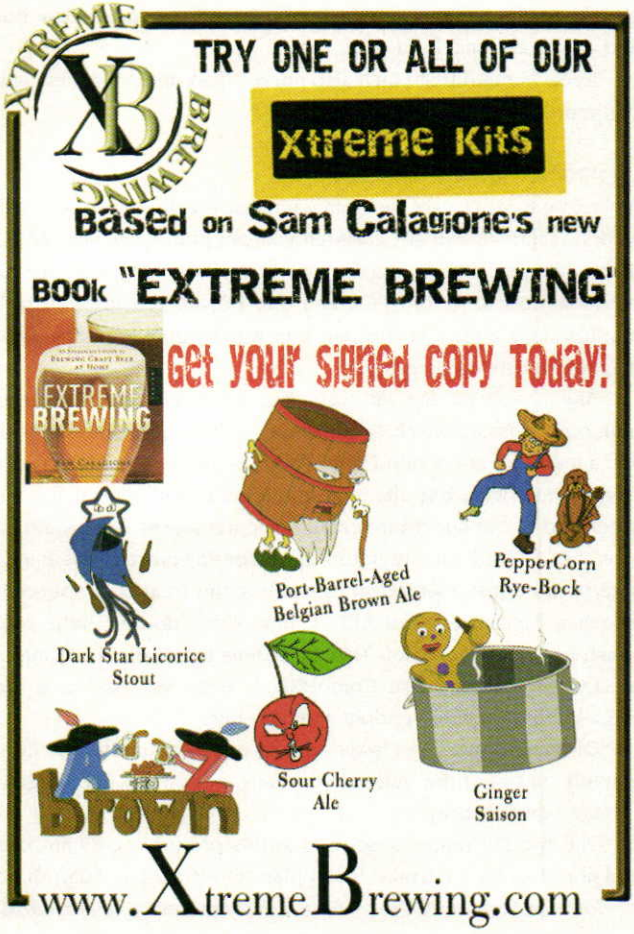
1.0 lb. (0.45 kg) Muntons Light dried malt extract
2 lb. 13 oz. (1.3 kg) Muntons Light liquid malt extract (late addition)
¼ tsp calcium chloride (60 mins)
⅛ tsp yeast nutrients (15 mins)
5.5 AAU Tettnang hops (60 mins) (1.2 oz./35 g of 4.5% alpha acids)
0.25 oz. (7.1 g) Hallertau Hersbrücker hops (15 mins)
Wyeast 2565 (Kölsch) or White Labs WLP029 (German Ale/Kölsch) yeast (3 qt./~3 L yeast starter @ SG 1.035)
1 cup corn sugar (for priming)

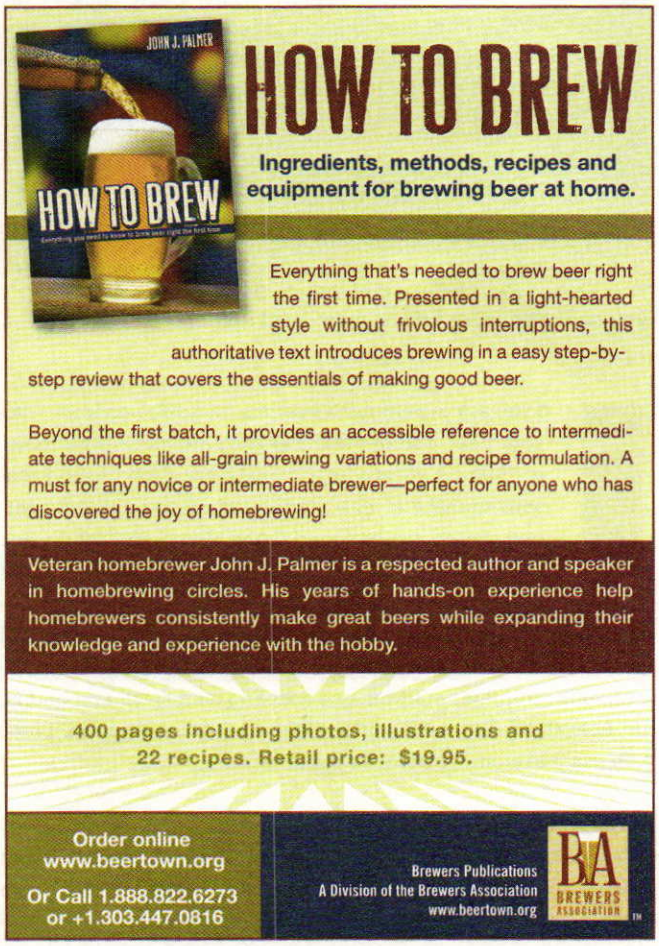
Step by Step

In a clean bucket, combine 6.0 gallons (23 L) of very soft (or distilled) water with a teaspoon of calcium chloride and a teaspoon of gypsum (calcium sulfate). Add a Campden tablet (for removal of chloramines), cover loosely and let sit overnight. This is your brewing liquor. Place grain bag with crushed grains in a 2-gallon (7.6-L) beverage cooler. Heat 5.5 qts. (5.2 L) of brewing liquor to 163 °F (73 °C) and stir this into grains. Mash grains, starting at 152 °F (67 °C), for 30 minutes.

While mash is resting, stir dried malt extract into 1.0 gallon (3.8 L) of brewing liquor in your brewpot and heat to 148 °F (64 °C). Also heat 5.5 qts. (5.2 L) of brewing liquor (for sparge water) to 180 °F (82 °C) in a separate pot. Run off first wort from cooler and pour into brew pot. Continue to hold the temperature at 148 °F (64 °C). Add sparge water to cooler, rest 5 minutes then run off second wort. Add the second wort to your brewpot and hold at 148 °F (64 °C) for another 10 minutes. (The enzymes from the partial mash wort will continue to work on any remaining degradable carbohydrates from the grain and malt extract, leading to a more fermentable wort.) Add about a half-gallon (1.9 L) of your brewing liquor to your sparge water pot and bring it to a boil. Add calcium chloride and bring wort to a boil. Once you see the hot break form, add hops and boil for 60 minutes. Every 10 minutes, top up the boil to its original volume (around 2.5 gallons/9.5 L) with boiling water. (This will help minimize wort darkening by keeping the wort from getting too thick. If you can boil more than 2.5 gallons/9.5 L vigorously, do so.) With 15 minutes left in the boil, add the final dose of hops and yeast nutrients. At the end of the boil, stir in liquid malt extract and let wort steep (with lid on) for 15 minutes before you begin cooling. Cool wort until outside of brewpot is cool to the touch. Combine with cool brewing liquor in your fermenter to make 5 gallons (19 L) of wort at 65 °F (18 °C). Aerate well and pitch yeast sediment from yeast starter. (Note: If don't make a starter, pitch two — or better yet three — packs of liquid yeast.) Ferment at 65 °F (18 °C), then rack to secondary and cold condition at 40 °F (4.4 °C) for three weeks or until beer falls clear. Bottle with corn sugar or keg and carbonate to 2.4 volumes of CO_2. Serve in a Kölsch glass (stange), if you have one.

Betsy Parks is the assistant editor at Brew Your Own.





BUILD YOUR OWN STIR PLATE 2

Do-It-Yourself Projects

Story and Photos by **Forrest Whitesides**

"I'm sorry, I can't let you underpitch, Dave." With a stir plate, you can raise more cells in your yeast starter.

If you ask experienced brewers for advice on improving your beer, one of the things they are most likely to say is, "Make a yeast starter!" There are a ton of good reasons to make a yeast starter and a good guide for getting started can be found in the March-April 2002 issue of *Brew Your Own*. One easy way to improve your yeast starter is to use a magnetic stir plate and stir bar during the fermentation of your starter. A constantly-stirred yeast starter will yield a higher cell count than an unstirred starter. Commercially available stir plates start out at about $80 for a small unit and go up from there. But, with a little ingenuity and some spare parts, you can make one yourself for much less.

Project Overview

The heart of the project is a strong neodymium magnet (more commonly known as a rare earth magnet) affixed to an 80mm 12-volt DC fan typically used in desktop computers. You'll also need some type of power supply, which will depend on which type of enclosure you choose, some nuts and bolts and washers and a suitable enclosure to house the whole project. For this article, two enclosure options are demonstrated: a wooden cigar box and an old external hard drive case.

Keep in mind that you'll also need a flask and a magnetic stir bar in order to use your new stir plate.

Choosing a Fan

An inexpensive PC case fan from your local electronics retailer will work just fine, as will any case fan you can pull out of any old PC that might be sitting around your house. Garage sales are an excellent source for old PCs, and one PC will provide you with multiple fans and a hard drive from which you can pull a great magnet for use in this project.

Any 12-volt DC fan will work, but some offer more features than others. Radio Shack, for instance, sells a barebones fan with just a lead wire and ground wire. This type of configuration is very easy to work with, but offers no rotational speed control. On the other end of the spectrum, computer parts maker Antec offers a nice case fan with an integrated three-speed selector switch, giving you a no-fuss method of controlling the rotational speed. It also has built-in colored LED lights, which doesn't help your yeast, but does look cool. The Antec fans are available at major electronics retailers, like CompUSA or Best Buy, and also are available from online vendors like New Egg.

Of course, you can always wire in a potentiometer for fine-grained control of the more simple fans, or you can use a multi-voltage power supply.

The two stir plates described in this project use 80mm fans and are ideal for 1-L flasks. If you plan to use a 2-L or larger flask for your starters, consider using a 92mm fan and a larger enclo-

sure, although 80mm will still work. The same project instructions apply, regardless of the size of the fan.

Although a strong magnet, a 12-volt DC motor (a fan, in this case) and a power supply are all critical to making a suitable stir plate, the options for enclosures are limited only by your imagination. Feel free to use this article as merely a starting point for creating your own design.

Power Supply

If you plan on building your stir plate in an external hard drive enclosure, skip this section, as the power supply is integrated into the case.

For those of you aiming for an old-school wooden look, you will need to power your fan with a 12-volt wall-adapter type power supply. You may very well already have one or more of these devices around the house as they are common sources of power for small electronic devices. A 9-volt power supply will also work, although it will make the fan spin slower than a 12-volt adapter.

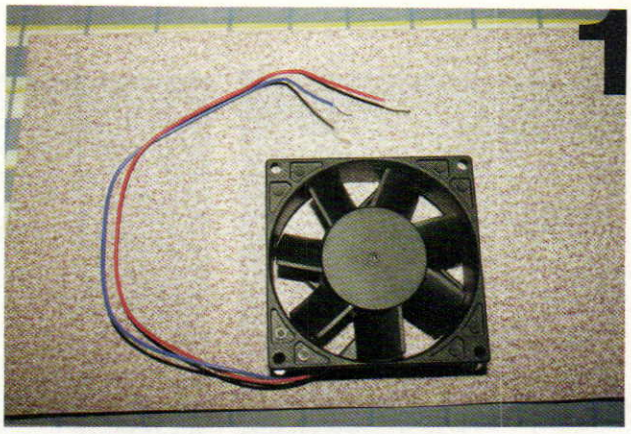
You can also use a multi-voltage power supply sold as a universal model to power many types of devices. These cost a bit more, but they allow for stepped control of fan rotation speed via selectable output voltage.

Whatever model you choose, you'll need to cut off the round adapter plug (the end that plugs into an electronic device) and strip back the wire an inch or so in preparation for splicing it to the fan's lead and ground wires.

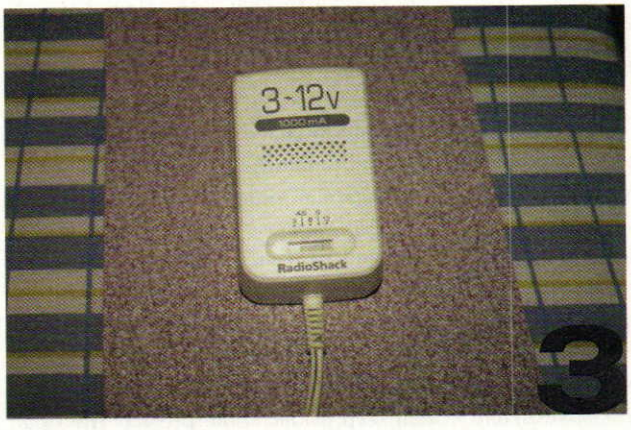
Sourcing Magnets

There are many places you can get an appropriate magnet for this project, including taking them from old or broken hard drives or ordering them from scientific supply shops.

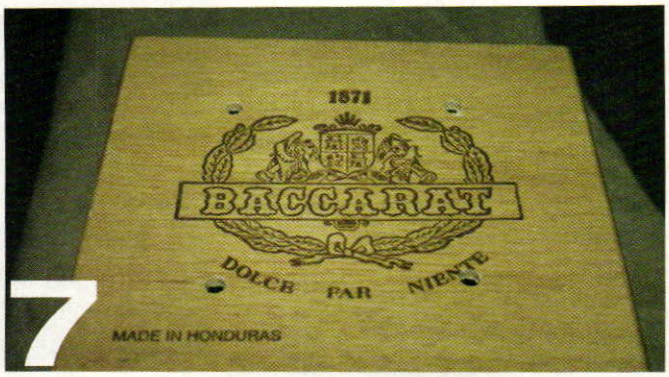
To remove a magnet from a hard drive, you will likely need a size T8 Torx screwdriver, a Philips-head screwdriver, a flat-head screwdriver and a pair of needlenose pliers. Use the Torx screwdriver to remove the screws around the edges of the cover plate. A center screw is often covered with a sticker. Pry the case open with the flat-head screwdriver to expose the platter and accuator arm. The magnet is located on the arm, often held in place with Philips screws. Hard drives don't all look the same inside, so you may have to improvise a bit to find and extract your magnet.

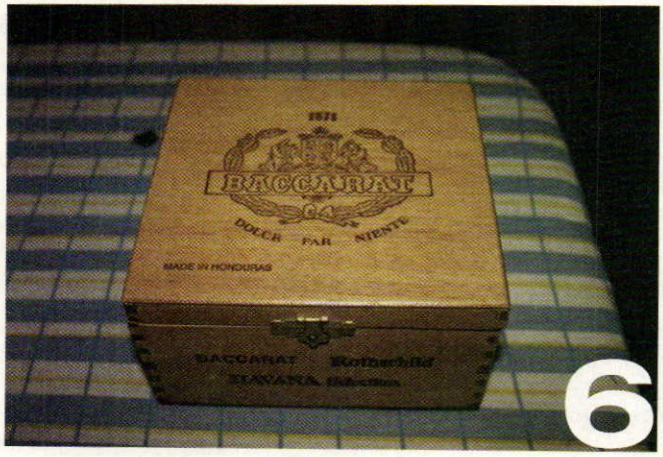


The heart of the stir plate is a DC motor to spin the magnet. In our case, we'll use the motor from a PC fan. Some simple fans have two wires for their power supply (Figure 1). Other fans additionally have a switch to control their speed (Figure 2).



A DC power supply converts alternating current (AC), from a wall outlet to direct current (DC). You can use a 12-volt power supply or a 9-volt power supply. A multi-voltage power supply (Figure 3) is another way to vary the fan speed. Strip the wires from the power supply (Figure 4) so they can be connected to the wires on the fan. Make sure the power supply is unplugged when you do this.





A rare earth magnet is attached to the fan (Figure 5). Getting the magnet correctly balanced on the fan will greatly reduce vibration in your stir plate. A cigar box (Figure 6) is one good choice for an enclosure. These boxes are sturdy, but the wood is thin enough that it doesn't affect the magnetic field-significantly. Four holes must be drilled in the box to attach the fan (Figure 7).

Preparing the Fan

No matter which enclosure you use, preparing the fan for use as a stir plate motor is the same. Center the magnet on the fan's hub (the central round surface to which the fan blades are attached). The magnet will be attracted to the metal coils inside the fan housing, which will hold it in place temporarily.

Holding the fan in your hand, give it a spin with your finger to check how well the magnet is balanced. If you feel some wobble, adjust the position of the magnet on the hub. When you have the magnet positioned properly, mark the edges with a felt pen and remove the magnet.

Now apply a small amount of multi-surface adhesive — I recommend Gorilla Glue — to the fan hub and reposition the magnet as marked. Allow the glue to dry as per the manufacturer's instructions, usually 12 to 24 hours, before installing it in your enclosure.

Balance is Critical

The balance of the stir plate is very important. One of the advantages of using common PC case fans, however, is that they have relatively low torque. Your stir plate may wobble a fair bit with nothing on top of it (especially a light-weight cigar box), but test it with a full flask before you start worrying. Consider that the liquid in a full 1-L flask weighs 1.0 kg (2.2 lbs.) and a 2-L flask would be, obviously, double that (plus the weight of the flask itself). In my tests, a two thirds full 1-L flask is sufficient to dampen all vibration and wobbling.

Also, because of the weight of the case and integrated power supply, external hard drive cases tend to have less problems with a poorly-balanced fan and magnet. If you want to use a cigar box, getting the fan balanced is the most important step in the whole project. The cigar box model I built vibrates quite a bit with no load, but with a 1-L starter on top, it didn't move a single millimeter over an 18-hour period of constant use.

Wooden Enclosure

PARTS LIST

Wooden cigar box (or equivalent)
80mm 12-volt DC fan
12-volt AC/DC wall adapter
Rare earth magnet
#6-32 x 2" machine screws
#6-32 machine screw nuts
#6 metal washers
¼" flat neoprene washers
¼" inside-diameter rubber grommet
Plastic wire connectors

Wood is classy looking, and there are some very nice readily available enclosures at your local smoke shop: cigar boxes! Many shops sell them for a few dollars each and some give them away. Not only are they cheap, but cigar boxes are very strong and, more importantly, very thin, which allows the full power of the magnet to be used. Once you've got your boxed picked out, it's time to drill some holes. (Note: For the cigar box stir plate, I used a simple fan from Radio Shack.)

Line up your fan flat in the center of the top of the cigar box lid and use a felt-tip pen to mark a dot for each of the four holes in the fan casing. If you can't find a pen small enough to get through the hole, you can also ink the end of a cotton swab and use that to make the four dots. Now drill four 13/64" holes on the dots. Since the sheet metal screws have a tapered head, countersink the four holes with a 7/32" bit to allow the screws to sit perfectly flush in the lid. Also drill a ¼" hole near the bottom of the rear panel and fit the hole with a rubber grommet. You may also want to

drill some holes in the enclosure to allow the motor to have some fresh air, so that the mechanical heat from the fan motor can be dissipated.

Open the lid, fit four screws through the holes and put a neoprene washer (to help with vibration dampening) and then a metal washer over each screw. Guide the four holes in the fan casing onto the screws and push the fan flush against the washers. Give the blades a spin with your finger to make sure the magnet clears the lid and the fan can spin freely. If it does not spin freely, remove the fan from the screws and add additional washers to put more space between the lid and the fan. Add a final metal washer after the fan and finish off with a nut for each screw.

Make sure that the power supply is unplugged before proceeding. Now pull the wires of the power supply through the grommeted hole in the back of the cigar box. Use a pair of wire connectors to splice together the two lead wires and two ground wires. (You can use a voltmeter to differentiate lead from ground, or you can just use trial and error). Plug the power supply into the wall to verify that the wiring is correct. As an additional touch, you can cut a piece of plexiglass to fit the lid of the cigar box to protect the wood and electronics from liquids.

Crack open your favorite liquid yeast and get started with a starter on your new stir plate!

Hard Drive Case

PARTS LIST

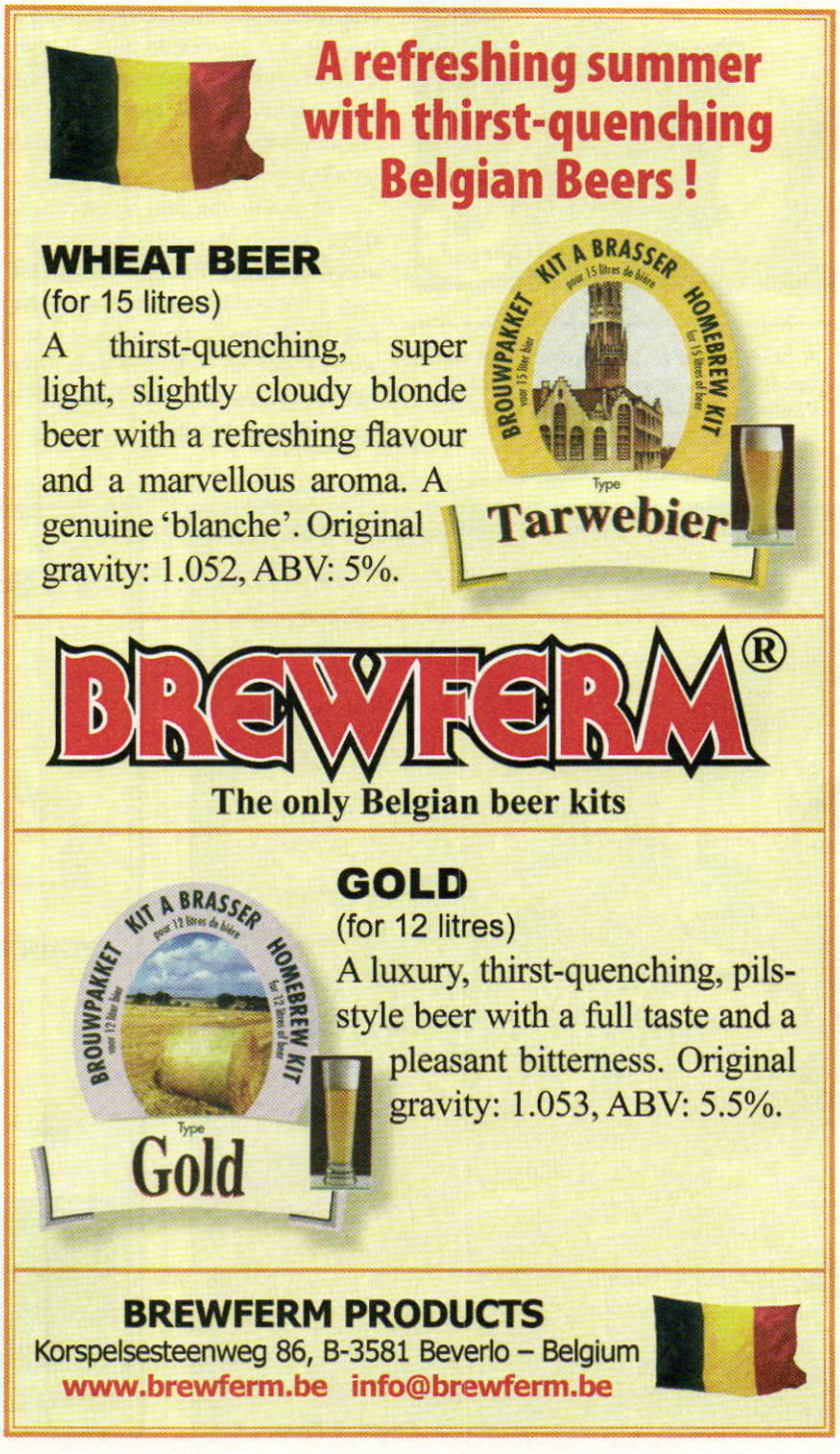
External hard drive case
80mm 12-volt DC fan
Rare earth magnet
#6-32 x 2" machine screws
#6-32 machine screw nuts
#6 metal washers
Plastic wire connectors (optional)

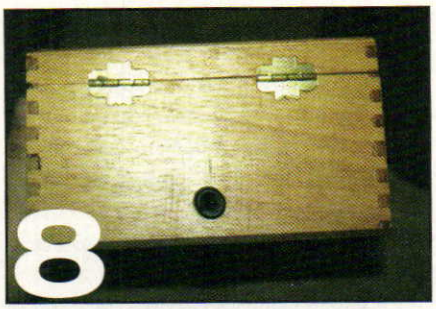
An external hard drive case makes an ideal starting point for a stir plate for several reasons. It has the appropriate power supply already built in, most fans connect to the power supply with a standard 4-pin connector (called a Molex connector) that just snaps in place and they generally have an off/on toggle switch built in. Some drive cases also have a small fan to expel heat from the case, a feature that will help keep your starter from fermenting too hot.

External hard drive cases are inexpensive (without a drive in them). Some models are available for less than $30 from major electronics retailers and online PC parts vendors. I got three older external cases (complete with broken drives) for free from a friend who works in the IT industry. For this project, I highly recommend a fan that has the standard 4-pin power connector for ease of construction.

If you're starting out with a new drive case, the inside should be nice and clean. The only thing you'll likely want to do is remove the hard drive data cable (it looks like a wide plastic ribbon) to make some space inside. On some models, the cable just unplugs from the internal circuit board, and on others you'll have to cut it off with scissors or a knife.

If you're using an old case, be sure to remove the hard drive and data cable to





A hole drilled in the back of the box accepts the power cord (Figure 8). Washers provide space between the fan and the box (Figure 9).

give you some room to work. It'll probably need some dusting as well.

As with the cigar box project, line up the fan on the center of the top of the case and mark the four holes with a felt pen or an inked cotton swab. Drill the holes first with a 3/16" bit and then countersink with a 7/32" bit. Follow the same directions as described above in the cigar box project to mount the fan in the case.

However, if the case you are using has low interior clearance, you can use a strong adhesive like Gorilla Glue to mount the fan to the inside top of the case instead of using screws. Just be sure to use a few washers as spacers to make sure the fan and magnet have enough clearance to spin freely.

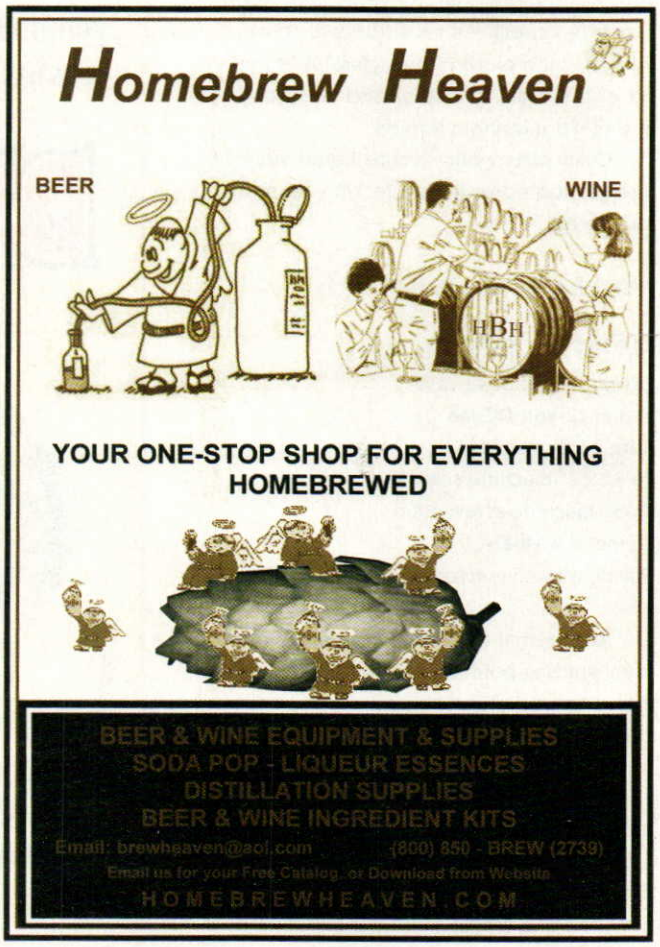
To power the fan, connect it to the drive case's built-in 4-pin power connector and you're done. If you are using a fan with only a hot and ground wire, you'll need to snip off the case's 4-pin plug and strip the wires about an inch. The four wires are: yellow (12-volt), black (ground), black (ground), red (5-volt).

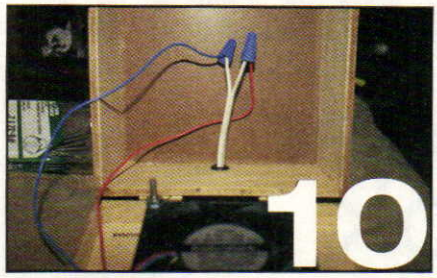
Connect the yellow wire (12-volt) and the adjacent black wire (ground) to the fan and terminate the other two wires with cap connectors. This is easy to do, but for the money (about $8), I recommend going with a fan that has the Molex connector so you can avoid the procedure altogether.

Plug the drive case into a wall outlet, turn on the power and you're ready to make a starter!

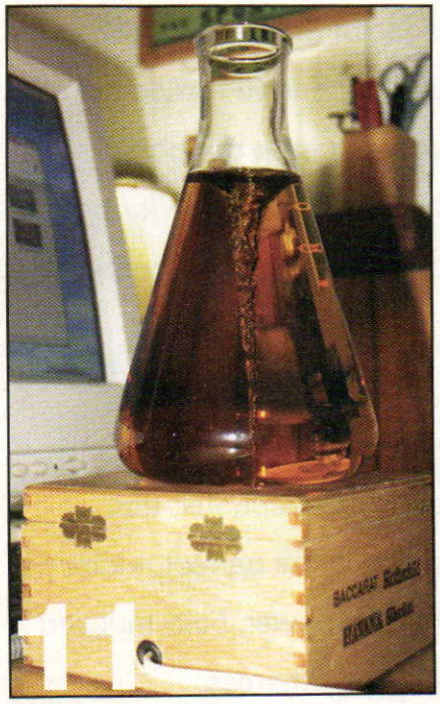
Fine Tuning

Magnetic stir bars can often be finicky. Even with commercial-grade stir plates, it is sometimes difficult to get them to spin properly. One of the easiest ways to get your stir plate operating smoothly is to use either a multi-voltage power supply or a fan with built-in speed selector. (The fancy fan is a much cheaper than the fancy power supply.) Start the stir bar off at a lower speed and then increase the speed when it is smoothly spinning. Starting off at too high or too low rotational speed often makes the bar jitter and dance, but not spin. The more options you have on





10



11

12

Once the power wires are connected (Figure 10), just plug it in and let 'er spin (Figure 11). A hard drive case (Figure 12) can also house the motor.

regulating the speed of the rotation of the fan and magnet, the easier it will be to get good results from your starter.

Forrest Whitesides would like to thank his good friends Rob Coker (who advised on wiring and power supplies) and Jim Kimball (who donated hard drives and fans) for making this project much easier than it could have been.

WHY PRO? for Mac® or PC

PROgressive

BeerTools Pro is all about innovation. Computers are more capable than ever, shouldn't brewing software be too?

PROductive

BeerTools Pro is designed to make quick work of recipe formulation and schedule management.

PROfessional

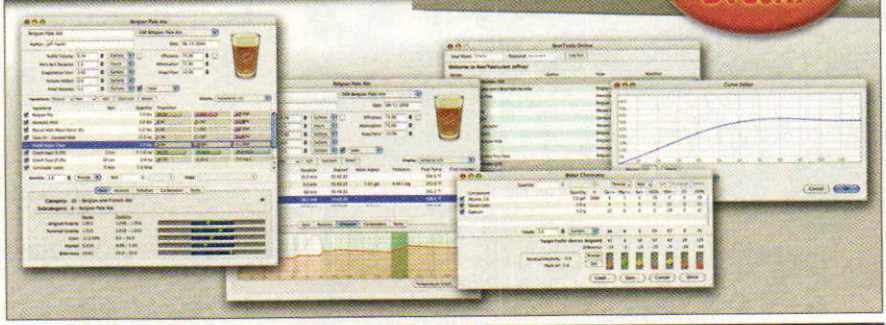
Into hardcore brewing? Go ahead, tweak your malt specs, customize your utilization algorithm...it can handle it!

www.BeerTools.com/byo

Beer Tools PRO

Brewing Calculation Suite

10% DISCOUNT USE PROMO CODE BYOJA7



Quality Wine and Ale Supply

Wine and Beer Making Supplies for Home Brewers and Vintners

2005 & 2006 Retailer of the Year

WineMaker International Amateur Wine Competition

Beer Making Kits and Home Brewing Supplies

Quality Products - Expert Advice - Fast Shipping

www.HomeBrewIt.com

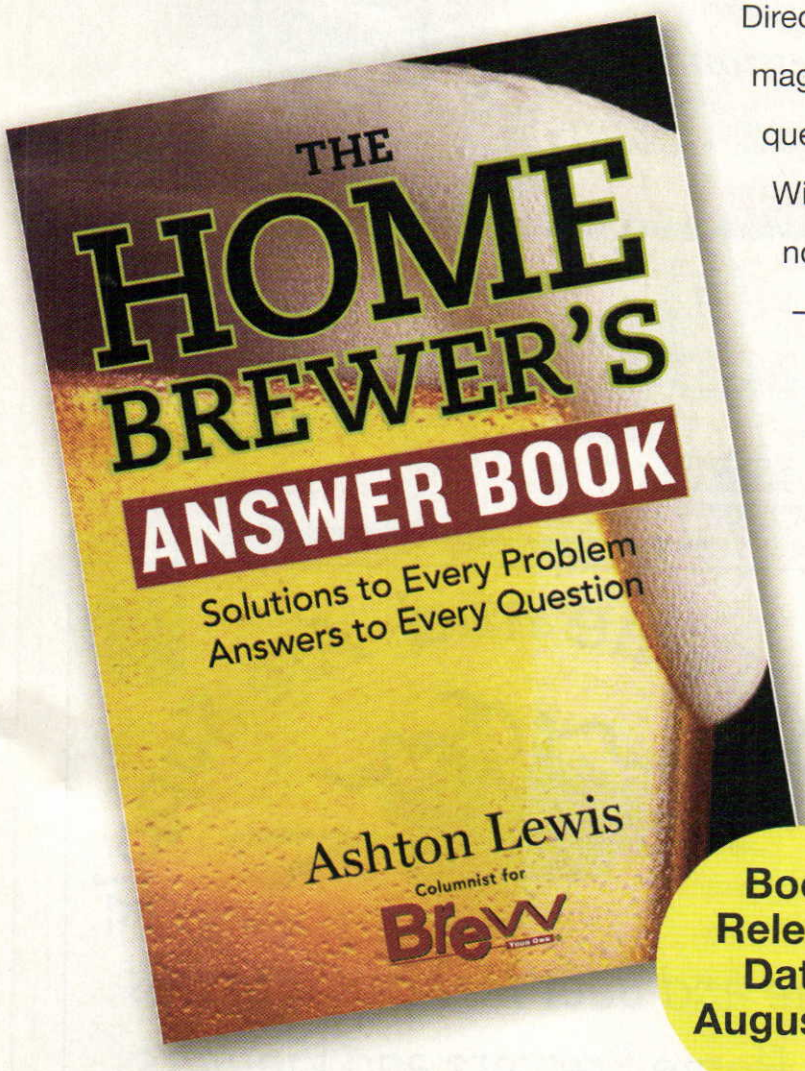
A proud sponsor of the Indiana State Fair Brewers Cup

Store: 108 S. Elkhart Ave., Elkhart, IN 46516

Mail: 530 E. Lexington Ave. Ste. 115, Elkhart IN 46516 ~ 574-295-9975

ANNOUNCING...

The Homebrewer's Answer Book



Direct from the pages of *Brew Your Own* magazine, this comprehensive collection of questions and answers from our popular "Mr. Wizard" department offers advice for both the novice and the advanced hobby homebrewer – and everyone in between!

Covering nearly every situation a homebrewer could encounter, this 425-page guide is the perfect reference for any amateur brewer. Fully indexed and organized by themes.

Find answers to your questions and fixes to your problems fast.

Book Release Date: August 29

Available at better brewing supply retailers and bookstores

Order now to reserve your copy for just $14.95 online at

brewyourownstore.com

or by calling 802-362-3981

Starting a starter

Build your own army of yeast cells at home

by Jon Stika

Brewers agree that it takes quality water, malt, and hops to make quality beer. Though this is true, these elements are ultimately transformed by the final ingredient: yeast. Our role as brewers is to provide the brewers yeast with the best environment possible to live, grow and make good beer.

Yeast plays an essential role in brewing beer and has a major impact on the overall flavor and quality of the finished product. For example, we have all heard interesting accounts of how homebrew club members split a wort and fermented each batch with different yeasts. Although each batch began with the same wort, each yeast will produce a unique and different beer.

Not only will different yeasts yield different beers from the same starting wort, but how well each variety of yeast works its magic also affects the outcome. Another interesting experiment might be to split one wort into several batches and pitch each of them with the same yeast that differs only in population, vigor, and purity. I believe the differences between resulting batches would be both interesting and surprising.

Situations in which the brewer put yeast at some particular disadvantage may not result in failure, but the quality of each batch would illustrate how important yeast management can be. Our goal is not simply to make beer, but to make the highest quality beer possible, and the goal in managing yeast for brewing is to produce a sufficient quantity of yeast that is full of life and ready to convert wort to beer. One of the best ways to provide a sufficient quantity of superior yeast is building a yeast starter from a pure culture.

Beginning with lab-cultured yeast provides a high probability that the strain is indeed pure. However, a pure yeast culture can only be as pure as your approach to handling it. Sanitation is essential throughout the process of creating a starter batch of yeast and cannot be over emphasized.

Commercial brewers usually aim to pitch around 1 million yeast cells per milliliter of wort per degree Plato of wort. That would amount to roughly 260 billion cells in a typical 5-gallon (19-L) batch of homebrewed ale, although you can still get good fermentation characteristics from most ale strains when pitching at about half this rate. For lagers, you should pitch 1.5 to 2 times as many yeast cells as you would for an ale.

Wyeast XL smack packs or vials of White Labs yeast contain 70 billion to 150 billion healthy yeast cells when they are packaged. After a container of yeast leaves the lab, however, its journey could be a perilous one. Factors like temperature, transportation and storage time all impact the viability of what eventually arrives in your hands. By the time you are ready to pitch a smack pack or vial of yeast into your carefully crafted wort, can you be sure it has a sufficient quantity of live yeast as intended by the manufacturer?

To achieve their target cell count, commercial breweries usually harvest and repitch yeast from batch to batch. Most homebrewers, however, don't brew batch after batch with the same yeast strain and so repitching is not as common at home (although it's certainly not unheard of). In order to reach our cell count targets, making a yeast starter is a good option.

Before building your microscopic yeast army, one might ask if you can have too many yeast cells in a batch of brew. While it is possible to have too much, overpitching a 5-gallon (19-L) batch of beer would require at least 400 billion cells. If you overpitch, you run the risk of producing a beer with a "rubbery" or excessively yeasty flavor, although the flavor differences may be small until really excessive yeast counts are reached.

Most homebrewers don't have the equipment needed to count their yeast. (See the December 2003 issue of BYO for

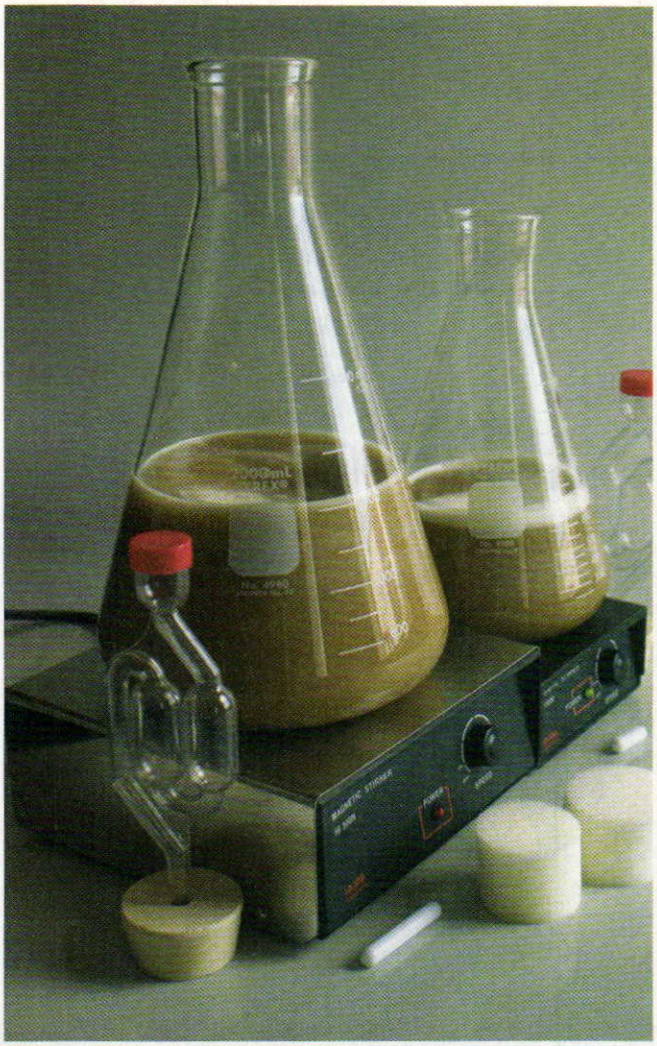


photo courtesy of Northern Brewer

A home magnetic stir plate setup is an efficient way to aerate a yeast starter while preventing contamination.

USING A STIR PLATE

Keeping yeast in suspension and providing an adequate supply of oxygen can be difficult to accomplish by simply swirling the wort in the flask by hand and setting it aside to propagate. An alternate method is to use a magnetic stir plate and a small aquarium pump to keep the yeast starter continuously stirred and aerated.

The entire set-up can be purchased for less than $150 from homebrew suppliers and your local pet shop, or you can build your own stir plate as described by Forrest Whitesides on page 44. For those who didn't take chemistry in school, a magnetic stir plate contains a revolving magnet which imposes its force on a magnetic stir bar that sits inside a glass container on top of the stir plate. This way, the liquid is stirred while the container remains closed to the outside world.

Meanwhile, air supplied by an aquarium pump is filtered through a 0.22 micron in-line air filter to reduce the risk of foreign yeast or bacteria entering the system. The yeast starter will usually propagate fairly quickly under the conditions in the stirred and aerated flask. If things went well, there should be a considerable layer of yeast (a quarter of an inch (0.6 cm) or more in a 2000 mL flask) in the bottom of the container.

When using a stir plate, start by sanitizing the stir bar and dropping it into your yeast starter. Place the starter on your stir plate and the stir bar should "jump" to the middle of the flask, to right over the magnet in the stir plate. Start stirring by turning the stir plate to its lowest setting. Next, gradually increase the rotation until the yeast starter is in constant motion. (You will see a vortex in the middle of the solution.) If you try to spin the bar too fast, it will "jitter" or fly off center. When this happens, turn the stirrer off, recenter the stir bar and start over at low speed.

You can retrieve your stir bar from the yeast starter by holding a strong magnet outside the flask and using the magnetic attraction to lift the bar out.

how to do this.) Instead, most rely on the fact that a yeast starter of a given size "should" contain a certain amount of yeast cells. For five gallons (19 L) of average-strength ale, a 1–2-qt. (1–2-L) yeast starter should grow an adequate number of cells. For a regular-strength lager of the same batch size, a 3–4-qt. (3–4-L) yeast starter is more appropriate. If you make a stirred yeast starter (see box at left), the size of your starter can be reduced by as much as half. For pitching recommendations more finely-tuned to the details of your beer, see Jamil Zainascheff's pitching rate calculator at www.mrmalty.com.

Building a starter

Here is the approach I use to build a yeast starter for a standard 5-gallon (19-L) batch of brew. Since it is difficult to know how many viable yeast cells survived the trip from the lab into my hands, I begin by making a starter of 1 pint (~500 mL) that I eventually build up to 1 quart (~1 L).

If you are using yeast in a smack pack, remove the pack from the refrigerator and

Perfect Results are Within Your Reach.

www.homebrewery.com
THE HOME BREWERY

From aspiring brew masters to seasoned veterans, The Home Brewery will help you achieve the perfect results. We're available to answer any questions you may have along the way. Expert equipment. Expert advice. Give us a call.

Call Today to Receive a FREE Catalog!
Featuring our Top 10 Tips for Creating the Ultimate Homebrew.

www.homebrewery.com
1-800-321-BREW(2739)
Ozark, Missouri

www.kegkits.com
Your homebrew kegging and draft beer keg source

Hardware	Refurbished Cornelius Kegs	CO2 Tanks
Bulk HOPS	All Metal Beer Towers	Keg Coolers
Pony Pumps	New Cornelius Kegs	Kegerator Kits
CO2 Regulators	Briess Malt Extract	Draft Beer Taps
Temp Controllers	Kegging Supplies	White Labs Yeast

1-866-KEGKITS (1-866-534-5487)

allow it to reach room temperature. Then, squeeze or smack it to rupture the capsule of yeast inside and release it into the nutrients. Leave it at room temperature to incubate and swell. Allowing the pack to swell provides proof that the yeast in the pack is alive before you go any further. If you are using a vial of yeast, simply let it reach room temperature then gently shake the vial to get the yeast into suspension, so none of it is stuck to the bottom of the vial. Next, we need to get a small batch of wort ready.

If you made a big batch of starter wort in the past and refrigerated some, grab a jar and allow it to come to room temperature. If not, make the appropriate volume of starter wort at a specific gravity of 1.020–1.040. (For every 1 qt./1 L of wort, use approximately 2.5 oz./70 g of dried malt extract.) Bring it back to a gentle boil for 15 minutes, cover and let cool to 75 °F (24 °C). To speed the cooling process, surround the bottom and sides of the pot with cold water. Don't allow any contamination of your mini-batch of wort as you only want pure yeast culture to grow in it, and nothing else. After the wort has cooled sufficiently, open the pouch or vial of yeast and dump it into a sanitized glass bottle or flask that accommodates at least 1 qt. (1 L). (I use a 1000-L or 2000-mL Erlenmeyer flask.)

"THE RULE OF THUMB FOR PROPAGATING YEAST IS TO INCREASE THE VOLUME AT EACH STEP BY NO MORE THAN TENFOLD."

Sanitizing your hands and the outside surface of the smack pack or vial with a little alcohol (my brewhouse sanitizer of choice is cheap vodka) before opening the pack or vial and pouring it into your container of wort. Seal the opening of the flask with a sanitized airlock and your yeast starter is ready to grow.

At this stage, the only thing that may be lacking in our little batch of beer is oxygen. An ample supply of oxygen is needed for the yeast to prepare for a life of wort-eating. There should be some oxygen in the wort to help the yeast get started if you accompanied the transfer with splashing. You could also increase the amount of oxygen in the wort by occasionally swirling the container vigorously. Swirling also benefits the starter by keeping the yeast in suspension and in greater contact with the wort. If you have an aquarium pump or oxygen tank you use for aeration, you can

WILLIAM'S BREWING

BREWERS!

Since 1979, William's Brewing has been a pioneer in innovative, quality home brewing equipment and supplies.

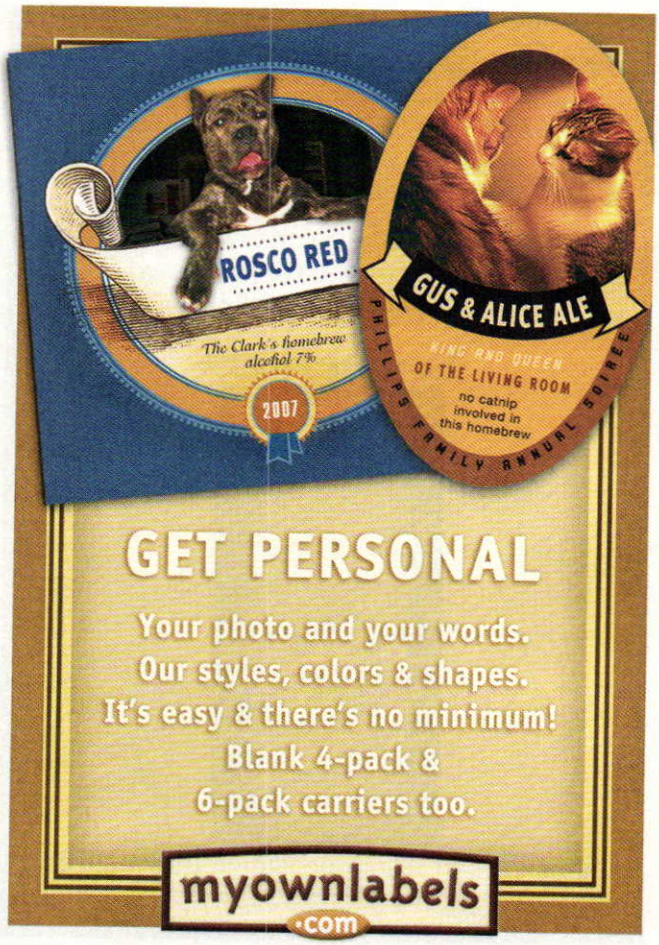
From our renowned William's Brewing Kits and Malt Extracts to our extensive line of unique brewing equipment, we have everything you need. All backed by our huge inventory, same-day shipping, and great customer service and support.

Check our website and request our catalog, for our full line of home brewing, winemaking, and coffee roasting supplies.

Free Catalog Requests: **800-759-6025**

2594 Nicholson St. • San Leandro • CA • 94577

www.williamsbrewing.com



also use that to more thoroughly aerate your starter.

After a day or two (at the most) the yeast in the starter should have multiplied as much as possible in the pint of wort. At this stage, make another pint-batch of sterile wort as before and feed it to the starter. Reattach the airlock, swirl vigorously, and set aside for another day of yeast growth. After the extra day of propagation, there should be a substantial layer of yeast at the bottom of the flask. At this point, the yeast can be swirled back into suspension and the contents of the container pitched into your 5-gallon (19-L) batch of wort.

Note that the rule of thumb for propagating yeast is to increase the volume at each step by no more than tenfold. If I wanted a larger starter, I could have stepped my pint-sized (500 mL) starter all the way up to 5 qts. (~5 L) — enough to pitch to over 10 gallons (38 L) of ale.

If you are making a yeast starter for a beer that you know will put some strain on the yeast — for example a high-gravity or high-adjunct beer — adding some yeast nutrient to your starter may be helpful. Keep in mind that commercial yeast has already been supplied with nutrients and too much yeast nutrient can overstimulate the yeast. Check the manufacturers recommended guidelines for addition rates and don't exceed them.

"A CAREFULLY-PREPARED YEAST STARTER ASSURES THAT YOU GET THE BEST BANG FOR YOUR BUCK OUT OF EACH LIQUID YEAST CULTURE . . ."

If your main batch of wort is well-aerated and kept at the proper temperature for the variety of yeast pitched, fermentation should be apparent in less than 24 hours. In some cases, you may see fermentation start within three to four hours.

A carefully-prepared yeast starter assures that you get the best bang for your buck out of each liquid yeast culture purchased. A suitable yeast starter also ferments the wort properly, giving it all the flavors and characteristics you would expect from an individual strain of yeast. My brewery may be a one-man operation, but keeping my couple hundred billion other "employees" happy makes me certain of attaining the best beer possible, every time.

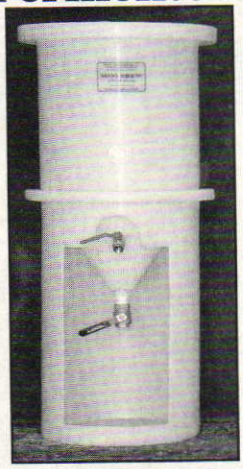
Jon Stika writes Techniques for each issue of Brew Your Own.

Hobby Beverage Equipment

FERMENTERS - MASH TUNS
HOT LIQUOR TANKS - THERMOMETERS

A major medical company and now a major brewery have purchased our plastic fermenters

Fermenters



What kind of recommendation do you need?

Box 1387 Temecula CA 92593 - 951-676-2337 – minibrew.com

ANNAPOLIS HOME BREW

Great Beer Recipes!

We specialize in tested & proven beer recipes. Using the finest ingredients, each recipe kit is measured and packaged by our brewmasters.

Visit our website to see what makes our beer recipe kits so good. Over 50 beers available in malt extract, partial mash, or all-grain!

Premium Malt Extract
Crushed & Sealed Grains
Grain Steeping Bag
UV & Oxygen Sealed Hops
Live Yeast Culture
Bottling Sugar & Caps
Step-by-Step Instructions
Some include fruit, honey, etc.

We're open 7 days a week!

Everyone on our staff is an experienced home brewer!

800-279-7556

Secure Online Ordering

www.annapolishomebrew.com

Brewing Science

Put your homebrew hypothesis to the test

by Chris Colby

Information on how to brew at home ultimately comes from a variety of sources. For starters, we have the long history of brewing to draw from. This history stretches back long before the scientific method was developed and much of what we know today about brewing must have been discovered by trial and error, perhaps with the occasional educated guess thrown in. More recently, brewing has been studied scientifically and much of the information we have about brewing comes from the careful study of English ales, German Pilsners and especially American-style Pilsners.

Of course, much of what we do as homebrewers has not been studied scientifically. The scale we brew at is not economically important (to the people who fund brewing science studies) and the wide variety of adapted pieces of equipment we brew on and the improvised techniques we employ would keep a large research lab busy for decades. And finally, let's face it, a lot of what we "know" about homebrewing is just someone's opinion. But what if you wanted to answer a homebrewing question or settle a homebrew argument once and for all? How would you approach this?

The only real way of gaining knowledge of the physical world is through scientific experimentation. And, with a little effort, any homebrewer can make a real contribution to the (almost non-existent) science of homebrewing. In this article, I'll describe the basic method for testing a simple idea (or hypothesis) scientifically. To do so, we'll imagine that two homebrewers from "BYOzarro World" want to determine which of two yeast strains will work better for brewing a batch of their beloved traditional Norwegian ale. We'll follow them through a variety of ill-considered approaches and eventually end up with a decent experimental method for testing this question.

The hypothesis

To set up our story, let's say that there are two companies in BYOzarro World that supply homebrewers with yeast — Black Labs and Zyeast. Black Labs has a strain of yeast they call BLP003 (Oslo Ale) yeast and Zyeast has a strain they call Zyeast 2112 (Norwegian Ale) yeast. Ole and Sven, both avid homebrewers and lovers of traditional Norwegian ale, wonder if there is a difference between the two and decide to find out.

Take one

As a first approach, Ole goes to his homebrew shop and picks up a tube of Black Labs yeast. Black Labs is the only yeast Ole's shop carries and Ole has always been happy with it. He brews a batch of traditional Norwegian ale and tries it. "Wow, this is great," he tells Sven. "I think Black Labs definitely makes the best yeast for traditional Norwegian ale."

Is Ole's "experiment" a good test of their hypothesis? No, in fact this isn't a test of the question at all. Even if the Black Labs strain did a good job in Ole's beer, no information about the Zyeast strain was gained in Ole's "experiment."

Take two

After trying Ole's beer, Sven suggests that they should each brew a beer — Ole using the Black Labs strain and Sven using the Zyeast strain — and compare the two. Ole agrees and brews another batch of beer. Sven grabs some Zyeast from his local shop and makes a Norwegian ale, using his grandfather's recipe for Norwegian Christmas ale (the one with dark grains and lingonberries). They meet a month later at Ole's house and taste the beers side by side. "You see," said Ole, "the Black Labs strain is better."

At this point, Ole's son Lars — who has been watching the taste-off — chimes in. "You know," he says, "your experiment really isn't a good test of your question. You are comparing beers made from two different recipes, brewed by two different brewers, on two different systems, with two different water sources and many other differences. You need to construct your experiment such that the only difference between batches of beer is the yeast strain — and you really need to do the experiment more than once to show that your results are repeatable."

"Repeatable," says Ole quizzically, "If I do it once, isn't that enough?"

"Not really," says Lars, "what if one of your batches got contaminated or had some problem that influenced the experiment? The results from a single trial could just be a fluke. You need to show that — if there is a difference between Black Labs and Zyeast — that the difference shows up repeatably."

At first Ole is reluctant. "That seems like a lot of brewing," he says.

"Yes," says Sven, "but that also means we get to drink a lot of Norwegian ale."

"In that case, "says Ole," I'll do it . . . for science."

So, the three put their heads together and begin to devise their experiment.

Take three

"I can brew a batch each weekend," says Ole, "This weekend with Black Labs yeast and the next weekend with Zyeast. Then I can brew the next two weekends and repeat the experiment. I'll use the same recipe and same ingredients each time."

Sven counters with, "Why not use the same exact wort for all four beers? Why not brew one big batch of beer, split the wort into four identical carboys. Pitch two of the carboys with two different tubes of Black Labs yeast and the other two with two different smack packs of Zyeast. That way, the only difference is the yeast!"

"Well not quite," Lars said, "You still need to aerate all four carboys separately. And, even if you set the carboys side-by-side, it's always possible some difference between them will exist."

"I don't see how," said Ole. "If I put them, say, both in the basement right next to each other, they are in exactly the same environment, aren't they?"

"They might be, "said Lars, "but what if one carboy is a little closer to the radiator downstairs and gets just a little bit hotter? What if light from the window falls on

one of the carboys for an hour or so during the day, but not the other? There are a lot of ways the two could experience different conditions, you'll just have try to eliminate every little difference."

Just then, Sven has a thought. "Hey," he says, "Black Labs yeast comes in a 35 mL tube, while Zyeast comes in a 125 mL smack pack — won't that affect our experiment?"

"It could," said Lars, "but maybe you could eliminate, or at least minimize, that difference by making four yeast starters."

"OK," said Ole," That sounds like a plan — are we set? I'll brew the beers and give them a taste, with a little help from Sven, and we'll see that Black Labs really is the best!"

At this point, Ole's wife Lena chimes in. "You know Ole," she said, "You already have a strong preference for Black Labs, isn't that right?"

"Ya sure, you betcha. I always bet on Black," replied Ole.

"Perhaps then, you aren't the best candidate to both brew and judge the beers. You'd have many opportunities to consciously or unconsciously influence the experiment."

"How so?" asked Ole.

"Well, if you knew which carboys had which yeast, you might give the Black Labs a little extra attention because you 'know' that it contains the best beer. And, of course, if you knew which two beers were the Black Labs beers, you might — consciously or unconsciously — judge the Zyeast beers unfairly."

"But," said Ole, "Sven doesn't have time to do the experiment. So, where does that leave us?"

"Well," said Lena, "maybe Sven could make the four yeast starters and label them so that you won't know which is which. That way, when you brew the beer, you won't have an opportunity to play favorites. Then, once the beers are ready, you could taste them first, and only get the code from Sven after you've written down your conclusions."

"You could also send the beers to a few different homebrew contests and bring them to a homebrew club meeting to get other people's opinions," said Lars.

Is it a plan?

OK, so let's leave BYOzarro World and discuss their planned approach. As it stands, it's a fairly decent experiment that could yield useful results (although, as we'll see, that's not guaranteed). In their experiment, the null hypothesis is that the two yeast strains cannot be distinguished by the experiment. Ole, however, thinks there may be a difference between the two yeast strains. In the lingo, this is called the alternative hypothesis.

Ole and Sven are definitely on the right track in their experimental design. They have eliminated most of the major differences between their four planned trials (the four carboys of traditional Norwegian ale). Splitting the wort means that the four yeast samples are working on wort made from the same recipe, on the same equipment by the same brewer. Of course, there still could be some differences between these trials. One of the

American Brewers Guild graduates won 9 Gold, 12 Silver and 8 Bronze medals and Guild instructors won 5 medals at this year's Great American Beer Festival...

The proof is in the BEER!

Enroll in our five week American Brewers Guild Intensive Brewing Science and Engineering Program which includes classroom instruction, sessions in the brewery and laboratory examining and using brewing equipment plus sensory evaluation. Spend five weeks immersed in the academic and hands-on aspects of modern craft brewing with some of the most renowned figures in the industry. The Craftbrewers Apprenticeship Program will include the residential weeks plus five additional weeks of hands-on training with a guild approved brewer mentor.

American Brewers Guild

AMERICAN BREWERS GUILD BREWING SCHOOL

Training the brewers of tomorrow today!

We're currently accepting applications for our Vermont Residential Program as well as our February 2008 distance-learning session.

Call us or email for more information (800) 636-1331
www.abgbrew.com • email: info@abgbrew.com

THE Good Brewer
Home Brew & Wine Making Supplies

The Good Brewer — Home Brew & Wine Supplies

We specialize in high quality supplies so you brew a high quality beer!

Whole & Pellet Hops

Bulk Grains--Full Sack Pricing!

Fresh Grain--No Cracking Fees!

Wyeast Activator Packs--100 Billion Cells

Briess Liquid & Dry Malt Extracts

Located at: 2960 Pacific Ave, Livermore CA 94550

(925) 373-0333 e-mail: info@goodbrewer.com

www.goodbrewer.com

carboys could be contaminated, the fill levels and degree of aeration might not all be exactly equal and — unless they counted their yeast — the pitching rate might vary. Would any of these make a difference? Maybe so, maybe not, but — when designing an experiment — scientists try to make everything the same between trials so they don't need to speculate about which differences might have an effect. Still, if reasonable care were taken to treat all four carboys equally, differences between the two strains should be detected, if they existed.

One very positive aspect of their experimental plan is that there are four independent trials — each yeast strain is used twice so they can see if their experimental results are repeatable. But is four trials enough to test between two yeast strains? The answer is . . . maybe. If the differences in performance between the two strains were fairly large, and the differences between batches made with the same yeast were fairly small, Ole and Sven may probably be able to detect a difference between the strains. However, if the differences between the strains were small, and the variability among tests of the same strain were fairly large, Ole and Sven might have to brew many, many batches of ale before a clear difference emerges. (To determine how many batches they would need and when the data suggested that there was a difference, the two would have to learn about statistics.)

In this experiment, Ole's wife proposed that the experiment be conducted blind — without Ole knowing which trial contained which yeast — because of Ole's known affinity for Black Labs yeast. Most scientific experiments, however, are not done blind. As a practical matter, most homebrewers performing experiments will likely perform and judge their own experiment. The availability of homebrew contests, however, at least allows that some comparison between beers can be made blindly. (However you can't request specific data from a homebrew contest. For example, if you wanted to compare diacetyl levels in four experimental trials, you couldn't instruct the judges to compare the diacetyl level for your four ales.)

Finally, it should be possible to collect "hard" numerical data for most experiments, in addition to subjective observations (i.e. taste and smell). For example, Ole could record how long it took each carboy to show signs of fermentation. Likewise, he could record the specific gravity (and pH) of the wort each day until fermentation was complete.

Science needs you!

There are a lot of open questions in homebrewing, and many could be answered with a decent experiment. There are myths to be busted and truths to be confirmed. If you (or your homebrew club) have an experiment you'd like to conduct, drop me a line (at chris@byo.com) and let's discuss it. I would love to present more experiments in *Brew Your Own* in the coming years.

Chris Colby has a PhD in biology from Boston University. He also has several cats.

LISTERMANN'S

Manufacturers of the PHIL'S line of homebrewing equipment

Wide selection of wine & wine cooler kits available

or try our tasty beer kits made from the personal recipes of our adequately-sober staff. **49 different styles from which to choose.**

- FREE SHIPPING -

on e-tail orders over $35

from east of the Mississippi River

Check out our retail website at

LISTERMANN.COM

or call (513) 731-1130

www.youngsgroup.co.uk

young's

World's largest distributor of home alcohol kits, equipment and accessories

Think Drink.....Think Young's

Cross Street, Bradley, Bilston,
West Midlands, WV14 8DL, UK
Sales: +44 (0)1902 353352
Fax: 44 (0)1902 354852

www.youngsgroup.co.uk
enquiries@youngsgroup.co.uk

brew

READER SERVICE

For direct links to all of our advertisers' Websites, go to www.byo.com

CLASSIFIEDS

APPAREL

GET YOUR BYO GEAR!
Logo shirts, sweats, hats,
& lots more.
www.cafepress.com/brewyourown

BREWING EQUIPMENT

The Barley Crusher MaltMill
"Homebrewer's best friend."
Mills for the homebrewer,
brew shop and microbrewer.
www.barleycrusher.com

LATEST AND BEST Homebrew Heaters now available in the U.S.!
See them at www.quickheat.net
E-mail us for a list of the Homebrew Shops who stock them – Dealer enquiries welcome.

PROFESSIONAL OPPORTUNITIES

Go Pro in Costa Rica
microbrewery start-up
25kL max annual production
http://hotel-tilawa.com/volcanobrew/
or contact jp@tilawa.com

SOFTWARE

BEERSMITH BREWING SOFTWARE
Take the guesswork out of brewing!
Free 21 day trial!
www.beersmith.com

SUPPLIES

DRAFTSMAN BREWING COMPANY
Don't dodge the draft!
Call today for our FREE
homebrew supply catalog.
1-888-440-BEER
www.draftsman.com

MICRO DISTILLING
Stills, Flavours, All Equipment.
Ex Factory
www.spiritsunlimited.co.nz

ZYMURGY OUTFITTERS
Specializing in custom ingredient kits from the ordinary to the extraordinary for all your homebrewing adventures.
www.zymurgyoutfitters.com
(608) 835-7370

WINEMAKING

WINEMAKER BACK ISSUES
Tips, techniques and recipes from magazine issues dating back to 2001.
Call 802-362-3981 or visit
www.winemakermagstore.com

WINEMAKER APPAREL

Logo hats, shirts, hoodies & much more!
www.cafepress.com/winemaker

Brew YOUR OWN

GREAT Gifts For You Or Your Brewing Buddies

Shirts, Sweats, Hats & Lots More!

Go to
www.cafepress.com/brewyourown
and order your Brew Gear today!

www.cafepress.com/brewyourown
SHOW THE WORLD YOU'RE A HOMEBREWER!

BREWER'S MARKETPLACE

FOXX EQUIPMENT company

Quality parts for the Home Brewer

Visit foxxequipment.com
to find a Home Brew Shop near you!

BYO BINDERS!

- Gold-stamped logo on front and spine
- Opens flat for easy use
- Leather-grained in royal blue
- Each binder holds 10 issues

Only $15 each (includes shipping)

Order Today at
brewyourownstore.com

Attention Homebrew Shops
Interested in selling
Brew?
It's easy!

- Free point-of-purchase display rack
- Big 45% discount off cover price
- Minimum order of just 5 copies
- Help drive more customer business and demand
- Flat shipping fee
- NEW! Free Online listing & Hotlink on byo.com!

To set up an account or find out more
call Dave at (802) 362-3981 ext. 107

HOMEBREW DIRECTORY

ALABAMA

Werner's Trading Company
1115 Fourth St. S.W.
Cullman
1-800-965-8796
www.wernerstradingco.com
The Unusual Store.

The Wine Smith
6800 A Moffett Rd. (US Hwy. 98)
Mobile 36618
(251) 645-5554
e-mail: winesmith@bellsouth.net
www.thewinesmith.biz
Serving Central Gulf Coast Homebrewers

ARIZONA

Brew Your Own Brew
2564 N. Campbell Ave., Suite 106
Tucson
(520) 322-5049 or 1-888-322-5049
www.brewyourownbrew.com
Where the art of homebrewing starts.

Homebrewers Outpost & Mail Order Co.
801 S. Milton Rd., Suite 2
Flagstaff
1-800-450-9535
www.homebrewers.com
Free Shipping in Arizona on orders over $50.

What Ale's Ya
6363 West Bell Road
Glendale
(623) 486-8016
www.whatalesya.com
Great selection of beer & wine making supplies.

ARKANSAS

Fermentables
3915 Crutcher St.
North Little Rock 72118
(501) 758-6261
www.fermentables.com
Complete homebrew & winemakers supply

The Home Brewery
455 E. Township St.
Fayetteville 1-800-618-9474
homebrewery@arkansasusa.com
www.thehomebrewery.com
Top-quality Home Brewery products.

CALIFORNIA

Beer, Beer & More Beer Riverside
1506 Columbia Ave. #12
Riverside 92507
1-800-622-7393
www.morebeer.com
Top-quality Supplies for the Home Brewer or Vintner.

The Beverage People
840 Piner Road, #14
Santa Rosa
1-800-544-1867
www.thebeveragepeople.com
Fast Shipping, Great Service!

Brewers Discount
8565 Twin Trails Dr.
Antelope 95843
1-800-901-8859
sales@brewersdiscount.com
www.brewersdiscount.com
Lowest prices on the Web!

Doc's Cellar
855 Capitolio Way, Ste. #2
San Luis Obispo
805-781-9974
www.docscellar.com
Largest beer & wine supplier on the central coast.

The Good Brewer
2960 Pacific Ave.
Livermore 94550
(925) 373-0333
Fax (925) 373-6232
www.goodbrewer.com
Whole and Pellet Hops, Rhizomes. Bulk Grains - Full Sack Pricing. Fresh Grain - No Cracking Fees. Wyeast Activator Pack - 100 Billion Cells. Briess Liquid and Dry Malt Extracts.

Home Brew Shop
1570 Nord Ave.
Chico 95926
(530) 342-3768
e-mail: homebrushop@yahoo.com
Years of experience, advice always free!

HopTech Home Brewing Supplies
6398 Dougherty Rd. #7
Dublin 94568
1-800-DRY-HOPS
www.hoptech.com
Beer, Wine, Root Beer-Kits & Brew Supplies!

HydroBrew
1319 South Coast Hwy.
Oceanside 92054
(877) 966-4769
(760) 966-1885
Fax (760) 966-1886
www.hydrobrew.com
Homebrewing & Hydroponics supplies serving the San Diego area.

Morning Glory Fermentation Supply
6601-C Merchandise Way
Diamond Springs 95619
1-866-622-9660
www.morninggloryfermentation.com
Great selection. Best quality. Awesome service!

Napa Fermentation Supplies
575 3rd St., Bldg. A (Inside Town & Country Fairgrounds)
P.O. Box 5839
Napa 94581
(707) 255-6372
www.napafermentation.com
Serving your brewing needs since 1983!

Original Home Brew Outlet
5528 Auburn Blvd., #1
Sacramento
(916) 348-6322
Check us out on the Web at www.ehomebrew.com

O'Shea Brewing Company
28142 Camino Capistrano
Laguna Niguel
(949) 364-4440
www.osheabrewing.com
Providing southern California with great beer!

Seven Bridges Organic Homebrewing Supplies
325 A River St.
Santa Cruz 95060
1-800-768-4409
Fax 831-466-9844
www.breworganic.com
Certified Organic Brewing Ingredients

Stein Fillers
4160 Norse Way
Long Beach
(562) 425-0588
www.steinfillers.com
brew@steinfillers.com
A nonprofit public benefit company.

COLORADO

Beer and Wine at Home
1325 W. 121st. Ave.
Westminster
(720) 872-9463
www.beerathome.com
Now Open!

Beer at Home
4393 South Broadway
Englewood
(303) 789-3676
1-800-789-3677
www.beerathome.com

The Brew Hut
15108 East Hampden Ave.
Aurora
1-800-730-9336
www.thebrewhut.com
Beer, Wine, Mead & Soda — WE HAVE IT ALL!

Lil' Ole' Winemaker
516 Main Street
Grand Junction 81501
(970) 242-3754
Serving Colorado & Utah brewers since 1978

Stomp Them Grapes! LLC
2563 15th Street, 101
Denver 80211
(303) 433-6552
www.stompthemgrapes.com
Because making it is almost as fun as drinking it!

CONNECTICUT

Beer & Wine Makers Warehouse
290 Murphy Road
Hartford 06114
(860) 247-BWMW (2969)
e-mail: bwmwct@cs.com
www.bwmwct.com
Area's largest selection of beer & winemaking supplies. Visit our 3000 sq ft facility with class & demo areas. New grain crushing room.

Maltose Express
887 Main St. (Route 25)
Monroe 06468
In CT.: (203) 452-7332
Out of State: 1-800-MALTOSE
www.maltose.com
Connecticut's largest homebrew & winemaking supply store. Buy supplies from the authors of "CLONEBREWS" and "BEER CAPTURED"!

DELAWARE

Delmarva Brewing Craft
24612 Wiley Branch Road
Millsboro 1-877-556-9433
Fax (302) 934-1701
www.xtremebrewing.com
contact@xtremebrewing.com
Make your own great beer or wine.

FLORIDA

BX Beer Depot
2964 2nd Ave. N.
Lake Worth 33461
(561) 965-9494
www.bxbeerdepot.com
Your one stop Beer & Home Brew Shop!!

The Shady Lady
2475 B East Nine Mile Rd.
Pensacola 32514
(850) 436-4436
www.theshadylady.net
From bottles to books, from kits to chemicals - We have everything to brew your own!

GEORGIA

Just Brew It
103 Rainbow Way
Fayetteville 30214
1-888-719-4645
Fax (770) 719-0274
www.aardvarkbrewing.com
9 miles south of Perimeter on GA Hwy. 85

Wine Craft of Atlanta
5920 Roswell Rd., C-205
Atlanta 30328 (404) 252-5606
www.winecraftatl.com
winecraftatl@bellsouth.net
Helping customers make beer and wine since 1969!

ILLINOIS

Bev Art Brewer & Winemaker Supply
10033 S. Western Ave.
Chicago (773) 233-7579
www.bev-art.com
Mead supplies, grains, liquid yeast and beer making classes on Premise.

The Brewer's Coop
30 W. 114 Butterfield Road
Warrenville 60555
(630) 393-BEER (2337)
www.TheBrewersCoop.com
DuPage County's LARGEST homebrew shop!

Chicagoland Winemakers Inc.
689 West North Ave.
Elmhurst 60126
Phone: 1-800-226-BREW
e-mail: cwinemaker@aol.com
www.cwinemaker.com
Personal Instruction!

Crystal Lake Health Food Store
25 E. Crystal Lake Ave.
Crystal Lake (815) 459-7942
Upstairs brew shop - Complete selection incl. Honey, Maple Syrup & unusual grains.

Home Brew Shop LTD
225 West Main Street
St. Charles 60174
(630) 377-1338
www.homebrewshopltd.com
Full line of Kegging equipment, Varietal Honey

Somethings Brewn'
401 E. Main Street
Galesburg 61401 (309) 341-4118
www.somethingsbrewn.com
Midwestern Illinois' most complete beer and winemaking shop.

INDIANA

The Brewers Art Supply
1520 N. Wells Street
Fort Wayne 46808 (260) 426-7399
e-mail: francie.brew@verizon.net
www.brewersartsupply.com
Friendly, Reliable service in house and on-line

Co-op Corner General Store
5015 N. St. Joe Ave.
Evansville 47720
1-800-398-9214 or
(812) 423-6481
raad@warrickcountycoop.com
Beer & Wine. Brew supplier for Southern Indiana.

Great Fermentations of Indiana
5127 E. 65th St.
Indianapolis 46220
(317) 257-WINE (9463)
Toll-Free 1-888-463-2739
www.greatfermentations.com
E-mail us at anita@greatfermentations.com

Kennywood Brewing Supply
Crown Point (219) 765-BREW
www.kennywoodbrew.com
Visit us online. Fresh homebrewing ingredients and more!

Quality Wine and Ale Supply
Store: 530 E. Lexington Ave.
Mail: 530 E. Lexington Ave. #115
Elkhart 46516
Phone (574) 295-9975
E-mail: info@homebrewit.com
Online: www.homebrewit.com
Quality wine & beer making supplies for home brewers and vintners. Secure online ordering. Fast shipping. Fully stocked retail store in Elkhart. 2005 & 2006 "Retailer of the Year".

IOWA

Bluff Street Brew Haus
372 Bluff Street
Dubuque (563) 582-5420
Fax (563) 582-5423
jerry@bluffbrewhaus.com
www.bluffbrewhaus.com
Complete line of wine & beermaking supplies.

KANSAS

Bacchus & Barleycorn Ltd.
6633 Nieman Road
Shawnee 66203
(913) 962-2501
www.bacchus-barleycorn.com
Your one stop home fermentation shop!

Homebrew Pro Shoppe, Inc.
2059 E. Santa Fe
Olathe (913) 768-1090 or
Toll Free: 1-866-BYO-BREW
Secure online ordering: www.brewcat.com

Kramer's Ale-N-Vino
925 N. Kansas Ave.
Topeka 66608 (785) 232-1990
e-mail: ale-n-vino@kscoxmail.com
www.ale-n-vino.com
Not the largest, just the best. Personal service.

MARYLAND

Annapolis Home Brew
836 Ritchie Hwy., Suite 19
Severna Park 21146
(800) 279-7556
Fax (410) 975-0931
www.annapolishomebrew.com
Friendly and informative personal service; Online ordering.

The Flying Barrel
103 South Carrol St.
Frederick (301) 663-4491
Fax (301) 663-6195
www.flyingbarrel.com
Maryland's 1st Brew-On-Premise; winemaking and homebrewing supplies!

Maryland Homebrew
6770 Oak Hall Lane, #115
Columbia
1-888-BREWNOW
www.mdhb.com
We ship UPS daily.

MASSACHUSETTS

Beer & Wine Hobby
155 New Boston St., Unit T
Woburn
1-800-523-5423
e-mail: shop@beer-wine.com
Web site: www.beer-wine.com
One stop shopping for the most discriminating beginner & advanced beer & wine hobbyist.

Beer & Winemaking Supplies, Inc.
154 King St.
Northampton
(413) 586-0150
Fax (413) 584-5674
www.beer-winemaking.com
30th year! Fresh White Labs.

Modern Homebrew Emporium
2304 Massachusetts Ave.
Cambridge 02140
(617) 498-0400
Fax (617) 498-0444
www.modernbrewer.com
The Freshest Supplies, In Business for 13 Years!

NFG Homebrew Supplies
72 Summer St.
Leominster
(978) 840-1955
Toll Free: 1-866-559-1955
www.nfghomebrew.com
Email: nfgbrew@aol.com
Great prices! Personalized service! Secure on-line ordering.

Strange Brew Beer & Winemaking Supply
331 Boston Post Rd. E. (Rt. 20)
Marlboro
1-888-BREWING
e-mail: dash@Home-Brew.com
Website: www.Home-Brew.com
We put the dash back in Home-Brew!

West Boylston Homebrew Emporium
Causeway Mall, Rt. 12
West Boylston
(508) 835-3374
www.wbhomebrew.com
Service, variety, quality. Open 7 days.

The Witches Brew, Inc.
12 Maple Ave.
Foxborough
(508) 543-0433
thewitchesbrew@att.net
www.thewitchesbrew.com
You've Got the Notion, We've Got the Potion

MICHIGAN

Adventures in Homebrewing
23869 Van Born Rd.
Taylor 48180
(313) 277-BREW
Visit us at www.homebrewing.org

Brewingworld
5919 Chicago Rd.
Warren 48092
(586) 264-2351
Brew on Premise, Microbrewery, Homebrewing Supplies
www.brewingworld.com
www.kbrewery.com

Cap 'n' Cork Homebrew Supplies
16812 - 21 Mile Road
Macomb Twp. (586) 286-5202
Fax (586) 286-5133
www.capncorkhomebrew.com
e-mail: capncork@covad.net
Wyeast, White Labs, Hops & Bulk Grains!

The Red Salamander
205 North Bridge St.
Grand Ledge
(517) 627-2012
www.theredsalamander.com

Siciliano's Market
2840 Lake Michigan Dr. N.W.
Grand Rapids 49504
(616) 453-9674
Fax (616) 453-9687
www.sicilianosmkt.com
The largest selection of beer and wine making supplies in west Michigan.

things BEER
Webberville
1-800-521-2337
www.thingsbeer.com
Your Full-Service Homebrew Shop With A Home Town Feel!

MINNESOTA

Midwest Homebrewing and Winemaking Supplies
3440 Beltline Blvd.
St. Louis Park 55416
1-888-449-2739
www.midwestsupplies.com
FREE instructional video with any purchase

Northern Brewer, Ltd.
1150 Grand Ave.
St. Paul 55105
1-800-681-2739
www.northernbrewer.com
Call or write for a FREE CATALOG!

HOMEBREW DIRECTORY

MISSOURI

The Home Brewery
205 West Bain (P.O. Box 730)
Ozark 65721
1-800-321-BREW (2739)
brewery@homebrewery.com
www.homebrewery.com
The original Home Brewery products.

Homebrew Pro Shoppe, Inc.
14 SW 3rd Street
Lee's Summit 64063
(816) 524-0808 or
Toll-Free 1-866-BYO-BREW
support@brewcat.com
www.brewcat.com
Secure On-line shopping - Complete line of beer & wine making supplies & equipment.

St Louis Wine & Beermaking LLC
251 Lamp & Lantern Village
St. Louis 63017
1-888-622-WINE (9463)
www.wineandbeermaking.com
The complete source for Beer, Wine & Mead makers!
Fax us at (636) 527-5413

MONTANA

Montana Home Brewing Supply
7220 Hwy 93 So.
PO Box 1142
Lakeside 59922
(406) 844-0407
e-mail: sales@mthbs.com
www.mthbs.com
Beer and wine making supplies

NEBRASKA

Fermenter's Supply & Equipment
8410 'K' Plaza, Suite #10
Omaha 68127
(402) 593-9171
Fax: (402) 593-9942
e-mail: FSE@tconl.com
www.fermenterssupply.com
Beer & winemaking supplies since 1971. Same day shipping on most orders.

NEW HAMPSHIRE

Kettle to Keg
161 Main Street
Pembroke 03275
(603) 485-2054
www.kettletokeg.com
Homebrewing supplies, tea & gifts

NEW JERSEY

BEERCRAFTERS
110A Greentree Road
Turnersville 08012
(856) 2-BREW-IT
E-mail: beercrafters@comcast.net
www.beercrafters.com
NJ's Leader in Home Wine & Beer Supplies

Brewer's Apprentice
179 South Street
Freehold 07728
(732) 863-9411
www.brewapp.com
Online Homebrew Shopping.

Rubino's Homemade Wine & Beer Supply
2919 Route 206, Store# 405
(located at the Columbus Farmer's Market) Columbus 08022
(609) 261-8420
homebrewsupply@optonline.net
www.makewinebeer.com
Beer making equipment & ingredient kits including: Brew House, True Brew & Brewer's Best.

NEW YORK

Bottom of the Barrel
1736 Mt. Hope Ave.
Oneida 13421 (315) 366-0655
Fax (315) 363-0670
www.bottomofthebarrel.biz
Best Little Homebrew Store Around.

E.J. Wren Homebrewer, Inc.
Ponderosa Plaza,
Old Liverpool Rd.
Liverpool 13088
1-800-724-6875
e-mail: ejwren@twcny.rr.com
www.ejwren.com
Largest homebrew shop in Central New York

Hennessy Homebrew Emporium
470 N. Greenbush Rd.
Rensselaer 12144
(800) 462-7397
www.beerbrew.com
Huge Selection, Open 7 days a week, Est. 1984

Niagara Tradition Homebrewing Supplies
1296 Sheridan Drive
Buffalo 14217
(800) 283-4418
Fax (716) 877-6274
On-line ordering. Next-day service. Huge Inventory.
www.nthomebrew.com

Party Creations
345 Rokeby Rd.
Red Hook 12571
(845) 758-0661
www.partycreations.net
Everything for making beer and wine

NORTH CAROLINA

Alternative Beverage
114 Freeland Lane
Charlotte
Advice Line: (704) 527-2337
Order Line: 1-800-365-2739
www.ebrew.com
29 years serving all home brewers' & winemakers' needs!
One of the largest suppliers in the country

Asheville Brewers Supply
2 Wall Street #101
Asheville 28801
(828) 285-0515
www.ashevillebrewers.com
The South's Finest Since 1994!

OHIO

America's Hobby House
4220 State Route 43
Brimfield/Kent 44240
Toll Free: (877) 578-6400
(330) 678-6400
Fax (330) 677-0826
www.americashobbyhouse.com
www.homebrewcompany.com
Specializing in winemaking / homebrew supplies & equipment.
Free monthly classes.

The Grape and Granary
915 Home Ave.
Akron 44310 (800) 695-9870
www.grapeandgranary.com
Complete Brewing & Winemaking Store.

Listermann Mfg. Co.
1621 Dana Ave.
Cincinnati 45207 (513) 731-1130
Fax (513) 731-3938
www.listermann.com
Beer, wine and cheesemaking equipment and supplies.

Main Squeeze
229 Xenia Ave.
Yellow Springs 45387
(937) 767-1607
www.mainsqueezeonline.com
Award Winning Brewers helping all Brewers!

Paradise Brewing Supplies
7762-C Beechmont Ave.
Cincinnati (513) 232-7271
www.paradisebrewingsupplies.com

The Pumphouse
336 Elm Street
Struthers 44471
1(800) 947-8677 or
(330) 755-3642
Beer & winemaking supplies & more.

Titgemeier's Inc.
701 Western Ave.
Toledo 43609 (419) 243-3731
Fax (419) 243-2097
e-mail: titgemeiers@hotmail.com
www.titgemeiers.com
An empty fermenter is a lost opportunity – Order Today!

OKLAHOMA

High Gravity Homebrewing and Winemaking Supplies
7164 S. Memorial Drive
Tulsa 74133 (918) 461-2605
e-mail:store@highgravitybrew.com
www.highgravitybrew.com
Build your own beer from one convenient page!

OREGON

Above the Rest Homebrewing Supplies
11945 SW Pacific Hwy, #235
Tigard 97223
(503) 968-2736
fax (503) 639-8265
e-mail: brewnow@netzero.com
www.brewnow.biz
Serving Beer & Wine Makers since 1993

PENNSYLVANIA

Ben's Homebrew
327 E. 6th Ave.
Tarentum 15084
Ph & fax (724) 409-4101
e-mail: benshomebrew@gmail.com
www.benshomebrew.com
For all your home brewing and wine making needs.

Country Wines
3333 Babcock Blvd.
Pittsburgh 15237-2421
(412) 366-0151 or
Fax (412) 366-9809
Orders toll-free 866-880-7404
Online catalog at:
www.countrywines.com

Keystone Homebrew Supply
599 Main St.
Bethlehem 18018
(610) 997-0911
sales@keystonehomebrew.com
www.keystonehomebrew.com
Quality Ingredients and Expert Advice!

Keystone Homebrew Supply
779 Bethlehem Pike (Rt. 309)
Montgomeryville
(215) 855-0100
sales@keystonehomebrew.com
www.keystonehomebrew.com
Quality Ingredients and Expert Advice!

South Hills Brewing Supply
2212 Noblestown Rd.
Pittsburgh
(412) 937-0773
shbsjon@aol.com
www.southhillsbrewing.com
Not your typical LHBS. Neat • Clean • Stocked • Experienced

Triangle Homebrewing Supply
2100 Smallman St.
Pittsburgh (412) 261-4707
www.ralph.pair.com/triangle.html
Bringing you the BEST for less!

Wine, Barley & Hops Homebrew Supply
248 Bustleton Pike
Feasterville 19053
(215) 322-4780
winebarleyandhops@worldlynx.net
www.winebarleyandhops.com
Your source for premium beer & winemaking supplies

Wine & Beer Emporium
100 Ridge Rd. #27
Chadds Ford 19317
(610) 558-BEER (2337)
winebeeremporium@aol.com
www.winebeeremporium.com
We carry a complete line of beer & winemaking supplies, honeys, cigars and more!

RHODE ISLAND

Blackstone Valley Brewing Supplies
407 Park Ave.
Woonsocket (401) 765-3830
Quality Products and Personalized Service!

SOUTH CAROLINA

Bet-Mar Liquid Hobby Shop
736-F Saint Andrews Rd.
Columbia 29210
(803) 798-2033 or
1-800-882-7713
www.liquidhobby.com
Unmatched Value, Service & Quality Since 1968

TENNESSEE

All Seasons Gardening & Brewing Supply
3900 Hillsboro Pike, Ste. 16
Nashville 1-800-790-2188
www.allseasonsnashville.com
Visit Our Store or Shop Online. Nashville's Largest Homebrew Supplier!

Brewers Corner
800 Park Ave., Suite E
Murfreesboro
(615) 849-7797
www.brewerscorner.com
Middle Tennessee's source for homebrew supplies.

TEXAS

Austin Homebrew Supply
7951 Burnet Rd.
Austin 1-800-890-BREW
(512) 300-BREW
www.austinhomebrew.com
Huge online catalog!

Brew It Yourself – Home Brewing Beer & Wine
25770 Interstate 45 North, #107
Spring (281) 367-2739
Fax: (281) 292-3965
e-mail: ray@biy-tx.com
www.biy-tx.com

DeFalco's Home Wine and Beer Supplies
8715 Stella Link
Houston 77025
(713) 668-9440
Fax (713) 668-8856
www.defalcos.com
Check us out on-line!

Homebrew Headquarters
300 N. Coit Rd., Suite 134
Richardson 75080
(972) 234-4411
1-800-966-4144
www.homebrewhq.com
Dallas' only home beer and wine making supply store!

The Winemaker Shop
3006 S.E. Loop 820
Fort Worth
1-800-482-7397 or
(817) 568-4700
brew@winemakershop.com
http://winemakershop.com
FREE catalog

UTAH

The Beer Nut
1200 S. State
Salt Lake City 84111
(888) 825-4697
Fax (801) 531-8605
www.beernut.com
"Make Beer not Bombs"™

VIRGINIA

HomeBrewUSA
5802 E. Virginia Beach Blvd., #115
Norfolk 23502
1-888-459-BREW
or (757) 459-2739
www.homebrewusa.com
Largest Selection of Beer & Wine Making Supplies & Equipment in Southeastern Virginia!

myLHBS
6201 Leesburg Pike #3
Falls Church
(703) 241-3874
www.myLHBS.com
We speak beer!

Weekend Brewer - Home Beer & Wine Supply
4205 West Hundred Road
Chester/Richmond area 23831
1-800-320-1456 or
(804) 796-9760
beerinfo@weekendbrewer.com
www.weekendbrewer.com
LARGEST variety of malts & hops in the area!

WASHINGTON

Bader Beer & Wine Supply, Inc.
711 Grand Blvd.
Vancouver, WA 98661
1-800-596-3610
Sign up for our free e-newsletter at www.baderbrewing.com

The Beer Essentials
2624 South 112th St., #E-1
Lakewood 98499
(253) 581-4288 or
1-877-557-BREW (2739)
www.thebeeressentials.com
Mail order and secure on-line ordering available

The Cellar Homebrew
Make your own beer & wine
14320 Greenwood Ave. N.
Seattle 98133
1-800-342-1871
FREE Catalog/Guidebook, FAST Reliable Service, 33 Years! Secure ordering online www.cellar-homebrew.com

Homebrew Heaven
9109 Evergreen Way
Everett 98204
1-800-850-BREW (2739)
Fax 425-290-8336
brewheaven@aol.com
www.homebrewheaven.com
Voted Best Online Web Site for Ordering

Larry's Brewing Supply
7405 S. 212th St., #103
Kent
1-800-441-2739
www.larrysbrewsupply.com
Products for Home and Craft Brewers!

Mountain Homebrew & Wine Supply
8520 122nd Ave. NE, B-6
Kirkland 98033
(425) 803-3996
info@mountainhomebrew.com
www.mountainhomebrew.com
The Northwest's premier home brewing & winemaking store!

Northwest Brewers Supply
1006 6th Street
Anacortes 98221
(800) 460-7095
www.nwbrewers.com
All Your Brewing Needs Since 1987

WISCONSIN

Grape, Grain & Bean
816 South 8th St.
Manitowoc
(920) 682-8828
Fax (920) 682-8828
www.grapegrainandbean.com
e-mail: ggandb@sbcglobal.net
Northeast Wisconsin's Homebrewing Supply

Homebrew Market
1326 North Meade St.
Appleton 54911
1-800-261-BEER
www.homebrewmarket.com
Beer & Wine Supply Retail Store and Mail Order

House of Homebrew
415 Dousman St.
Green Bay 54303
(920) 435-1007
Fax (920) 435-1008
staff@houseofhomebrew.com
www.houseofhomebrew.com
Beer, Wine, Cider, Mead, Soda, Coffee, Tea, Cheese Making.

Midstate Fermenters LLC
1425 Wisconsin Dells Pkwy, #3
Wisconsin Dells 53965
Phone or fax (608) 253-FERM
info@midstatefermenters.com
www.midstatefermenters.com
Home Brewing, Winemaking and Kegging Supplies.

Point Brew Supply
1816 Post Road
Plover 54467 (715) 342-9535
marc@pointbrewsupply.com
www.pointbrewsupply.com
"The Feel Good Store with a Professional Brewer on Staff"

WindRiver Brewing Co., Inc
861 10th Ave.
Barron 54812 1-800-266-4677
www.windriverbrew.com
FREE catalog. Fast nationwide shipping.

Wine & Hop Shop
1931 Monroe Street
Madison 53711
1-800-657-5199
www.wineandhop.com
Southern Wisconsin's largest selection of beer & winemaking supplies. 10 varieties of wine-making grapes from Mitchell Vineyard.

CANADA

ONTARIO

Canadian Home Brewing
3347 Mainsail Crescent
Mississauga L5L 1H3
1-877-568-BREW
Fax: 905-919-1636
info@canadianhomebrewing.ca
www.canadianhomebrewing.ca
Quality Home Brewing Supplies. Order Online.

INDIA

PUNJAB

Pacific Merchants
D 74 Focal Point Extension
Jalandhar
Punjab 144004
Phone: +91-181- 26 000 29
Fax: +91-181- 24 560 84
sales@chrome.co.in
www.chrome.co.in
Manufacturers of Homebrew Equipment & Kegging Hardware!

SHOP OWNERS
For details on listing your store in the Homebrew Directory call (802) 362-3981

HOMEBREW DIRECTORY

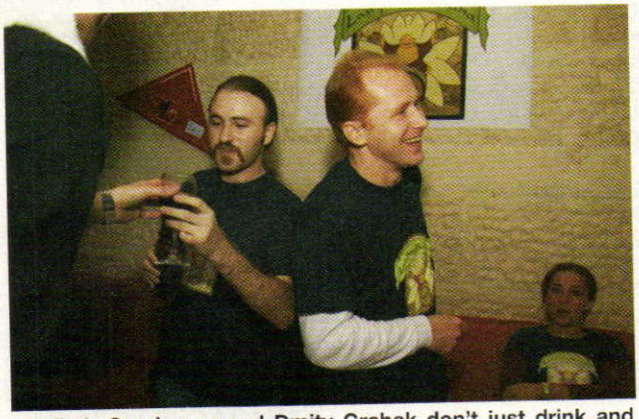
Last Call

A Beer Philosophy

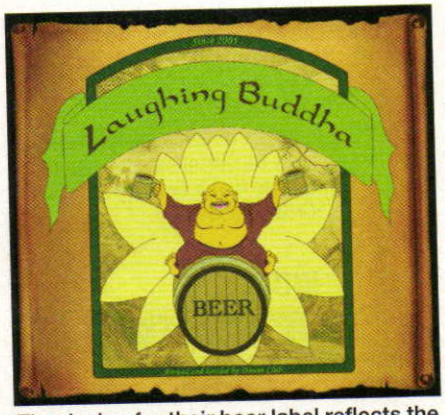
Some friends take beer to the spiritual level

by Vladimir Gershanov and Dmitry Grabak • Tel Aviv, Israel

Dzin', a Russian word pronounced with a soft "N", is the sound of clinking glasses and basically has a meaning of "Cheers" but with more depth and meaning to all those who were among the "enlightened" bunch who later became the founding core of the Dzin' Club.



Vladimir Gershanov and Dmity Grabak don't just drink and brew beer, they philosophize it.



The design for their beer label reflects the concept of Dzin' Buddhism.

Since the birth of our group, every single "dzin'" has brought us closer and closer to the "enlightenment," which at the end, took the form of a new "philosophical" concept.

Later on, this concept received its current name "Dzin' Buddhism" (by the analogy with a Zen Buddhism) but with no actual connection to Buddha, we just liked how it sounded. The Dzin' Buddhism has evolved into the name "Dzin' Club," which consists of three friends — Dmitry Grabak, Vladimir Gershanov and Stas Pruchansky — and those who helped us with our quest of finding different quality beer, and those who helped us later when we started brewing our own beer and supported us throughout the journey.

In one word, we can say that Dzin' Buddhism is sort of our beer "religion". The hierarchy of Dzin' Buddhists in the Dzin' Club is somewhat similar to a spiritual hierarchy in a religion of Buddha and other religions — there's a Guru, a Prophet, a Patriarch, an Apostle, a Missioner and a whole bunch of other "enlightened" people represented.

Dzin' Buddhizm has been a good kick start for a lot of ideas, lots of fun, beer discovery and, of course, beer drinking.

We started brewing beer in February 2005 — a few years after founding the Dzin' Club. The idea of brewing our own beer was floating around for a while but it came to life when we got a newsletter from a new pub we had recently discovered in our quest for new beers — the Norma Jean in Tel Aviv, Israel. The newsletter introduced us to a new homebrewing course at the pub and we jumped at the idea. The rest, as they say, is history.

When we decided to start brewing our own beer, the "Dzin' Buddhism" concept already existed, which was a problem when we were trying to think of a name that everyone would understand. Since Dzin' is more understandable to the Russian population among us, we decided that Laughing Buddha was the best choice because it suited our concept, and the image of that funny, tubby Buddha comes to mind immediately. After much discussion, we unanimously agreed on it.

Later on, we also decided to use the tubby, laughing Buddha image as the main image for our beer label so that everyone can share in the fun.

"We have come to understand that any dream can come to life if you work hard enough on making that dream real . . ."

Our eternal quest for new and special beers, tastes and flavors also transfers to the beers we brew. We like to make our beers with a twist or with some special herbs, fruits, and other ingredients that would sound strange for some of the common folk in Israel (and probably even in many other countries).

We have faithfully followed the "craziness" and boldness of the Belgian brewers and of some of the best American craft breweries like the Dogfish Head Brewing Company, Stone Brewing Company, and Samuel Adams. We've been compared to the Delirium brewery (in Belgium) due to our crazy ideas we implement into our beers (for example we once brewed a beer with a cactus fruit).

We are now looking into and planning to open a very small micro brewery (more of a nano brewery) to start, so that we can bring our product — Laughing Buddha Beer — to the Israeli beer-drinking folk that is interested in more than just a plain lager, but is also looking for a gourmet character in the beer.

We have come to understand that any dream can come to life if you want it hard enough and work on making that dream real.

So to our friends — Dzin'! And we hope we'll all have a lot of good beer to drink and choose from.

MoreFlavor!™
Create Your Own Great Flavor

MoreBeer!™ • MoreWine!™ • MoreCoffee!™

Who is MoreFlavor!?

MoreFlavor! Is the result of homebrewers who were passionate about beer. They started with making their own beer, became beer judges, started Beer, Beer & More Beer (now MoreBeer!) with a $2,000 investment, developed and manufactured equipment, worked very hard, helped push the entire industry into more all-grain brewing and are still very passionate about great beer! But we didn't stop there....

New Websites

We are excited to release our newly updated websites! Please note you can shop on all sites using the same shopping cart.

MoreBeer!™ - www.MoreBeer.com

- Thousands of beer making products
- Award winning brewers on staff
- Brewing Sculptures All-Grain systems
- Self-Cooling Stainless Conicals
- Monthly Podcasts downloadable from homepage
- Over 175 Frequently asked questions already answered

MoreWine!™ - www.MoreWineMaking.com

- The largest selection of winemaking products anywhere
- Over 15 free MoreManuals on all aspects of winemaking
- Winemakers on staff to answer your questions
- Comprehensive product information online
- Represent major European equipment manufacturers in U.S.
- Take it professional with MoreWine! Pro™ division (MoreWinePro.com)

MoreCoffee!™ - www.MoreCoffee.com

- Roast your own coffee at home. It's Easy!
- Green coffee beans from around the world
- Read tasting notes on every coffee bean we carry
- Comprehensive tutorials on equipment & processes
- Create your own blends with our Personal Blend Assistant
- Learn about coffee like you did about beer or wine

We just DOUBLED our Distribution Center! This has resulted in:

- Faster shipping – 95% of all orders now ship the same day they are received.
- Even more inventory and selection = more grains and more hops
- In peak seasons (wine/holiday) we can now ship up to 500 orders per day.

FREE SHIPPING ON MOST ORDERS OVER $59.00

$10.00 OFF

As an incentive to visit our new websites we are offering you:
$10 off a web order of $50 or more. Please use code BYO715 at time of checkout
Offer good through July 15th. One coupon code per customer.
Not combinable with any other offer.

www.MoreFlavor.com • 1-800.600.0033

Three Retail Locations To Serve You!

Northern California
995-G Detroit Ave.
Concord, CA 94518
1-800-589-4048
Ask for Jonathan Plisé

NEW
Northern California
991 N. San Antonio rd
Los Altos, CA 94022
1-800-589-4048
Ask for Phil Montalbano

Southern California
1506 Columbia Ave.,
Suite 12
Riverside, CA 92507
1-800-622-7393
Ask for Rob Arbagey

Brew with pride

Muntons

To brew memorable beers and ales you need quality ingredients you can trust. And when it comes to selecting quality ingredients, you can't buy better than Muntons.

English maltsters Muntons produce a range of brewer's malts and specialist kits to help you make authentic, quality beers and ales which provide consistent, memorable beers. To start you can use a kit for ease and convenience or select one of our celebrated malts for authentic grain mash brewing. Whatever way you choose to brew, you'll find a Muntons product to suit your every need and a result to be proud of.

For a quality brew every time, ask your homebrew retailer for Muntons.

Muntons pilsner • bitter • lager • stout • ipa • kits • improvers • malts • and more...

Muntons homebrew products are made in England.

For more information contact: Muntons plc, Cedars Maltings, Stowmarket, Suffok England IP14 2AG. 0044 14 49 61 83 00

www.muntons.com