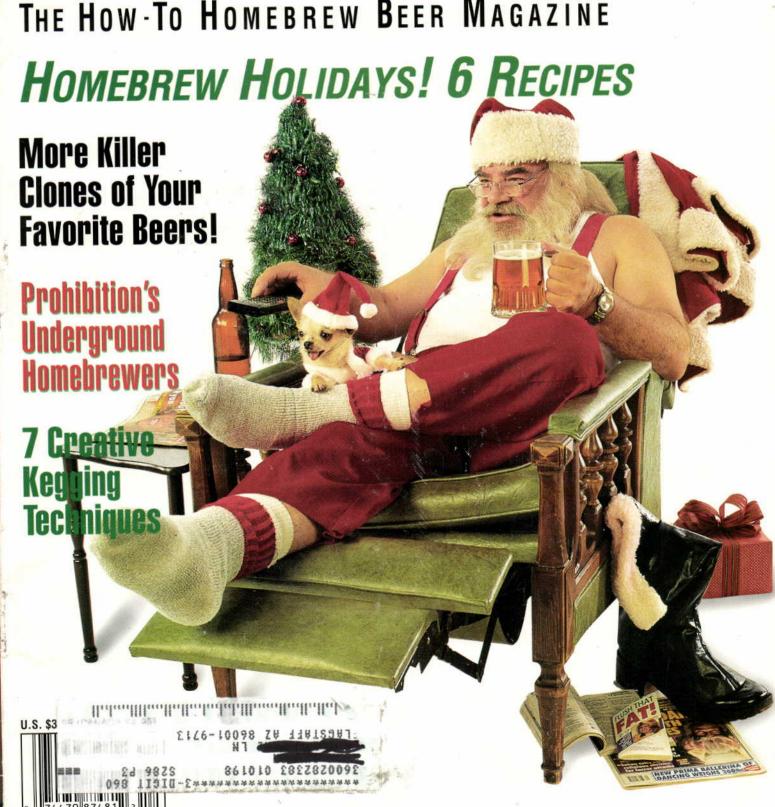


December 1997, Vol.3, No.12 Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE





What if you could try a different beer every day? Would you do it? Would

We get comfortable. We stay there. Why leave? For a lot of people, trying something new happens

And the truth is, beer with flavor just isn't for everybody. Nor for every situation. If Pete could ask

you willingly subject your taste buds to a daily foray into the unfamiliar?

Pete would. In fact, Pete thinks the world would be a better place if everyone could try a different beer every day.

Seven out of ten people

don't like our beer. Here's

why we're delighted:

(And yes, he realizes it would be an even better place if someone else was paying.)

accidentally - only when there is no other choice. "Oh, you're out of Brand X? Then uh... give me just one thing of his fellow humans, it would be this: "Try new things." It's not a new message. It sure isn't flashy. But it's short and to the point. Pete isn't the only guy to ever brew his

own beer. And he won't be the last. Maybe you're the next 'Beer Guru' waiting to happen. Heck,



















"Howie"

"Roxanna"

"Kristian

'Matt"

"Sandy"

"Robert

"Jude"

"Pierre"

"Ramone

Seems like there are an awful lot of beer companies out there saying, "The best beer in the country." Or, "Voted best beer of 1992." Stuff like that. C'mon. We're smarter than that. It's an insult to any real beer lover's intelligence.

The truth is, there are 50 many great beers out there. And so many different times, places and situations in which a particular beer might be appropriate.

Think a second: Do you know anyone who drinks the same beer all the time? If you "wanswered, "The whole country," you're right (statistically, anyway). Craft beers are but a mere speck in the ocean of the total beer consumed in this country. Why is that? Pretty simple really. People are

creatures of habit. We find a spot.

XX XX XX XX XX

a Brand Y." Bang. Zip. Boom. A new experience is spawned.

Alas, what do you think happens when people who have been drinking virtually 'flavorless' beer for the last five or ten years, take their first sip of a Pete's Wicked Ale?

Darn right.

A good seven out of ten of 'em make a face like they've just tasted beer for the very first time. Which strangely enough is precisely why we're delighted.

In the first place, seven out of ten people "not" liking us, means there's at least three people who

"do" like us. And secondly, they really are "tasting" beer for the very first time. Beer with aroma.

Beer with flavor.

maybe you're the next Darwin, or van Gogh.

But the most important thing to remember is, that not 'everyone' is going to love what you're doing. But you can take comfort in one fact: That if you practice your craft with love, passion and integrity, the right people will find you. (They always do.)

But should you happen to meet one of those 'other' people who walk up to you on the street and boldly say: "Mr. van Gogh - I do not care for your paintings at all. No sir, not at all." You will be ready. And with a smile, you will boldly

reply: "I assure you sir, that you indeed, are not alone." May your faith, optimism and lust for new experiences never die. (Cheers.)



"Wicked Ale"

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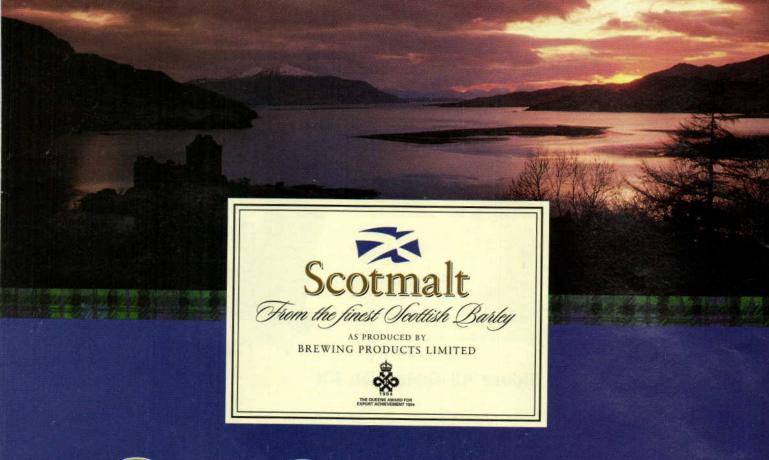
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# t's Better to Give...

It's that time of year once again when peace and goodwill are in the air, and all our thoughts turn to the same thing: the holiday wish list.

Making a list is a great holiday tradition. It began hundreds of years ago in Sweden when a nine-year-old child named Sverge received a pair of bright yellow sheepskin ear muffs from his Great Aunt Helga. After being teased by his classmates all winter (11 long months), Sverge decided the following year to make a list. That way, he reasoned, Auntie H. would spend her money on something he liked, his parents wouldn't have to force him to wear some "nice present," and everybody would be happy.

It didn't work, of course, but the idea seemed good. So it was adopted by kids young and old throughout the world.

Times have changed, but the tradition of holiday list making continues, and so does the success rate. How many grandparents do you know who have given their grandkids those supercool baggy demin shorts that hang down to mid-butt and extend to mid-calf (half-calf for you Californians)? None. And it's a good thing, too. It would crush the polyester market.

In the spirit of the season, I'm presenting a holiday wish list for homebrewers. Sure, you probably won't actually get any of this stuff. But you have to have a list. People will ask. So I've done the work for you.

And by the way, it doesn't matter what holiday you celebrate. This one I'm calling Beermas. Celebrate when you want, how you want. Just be sure to enjoy a homebrew or two.

Here it is. It works best if you sing along.

The 12 Days of Beermas. On the first day of Beermas, my true love gave to me

A Lag'ring Re-frig-er-a-tor. Okay, stick with it. It gets better. On the second day of Beermas, my true love gave to me Two Fertile Yeasts And a Lag'ring Re-frig-er-a-tor. Are you singing? You know the tune.

On the third day of Beermas, my true love gave to me

Three Fast Stoves,
Two Fertile Yeasts,
And a Lag'ring Re-frig-er-a-tor.
Okay, okay, let's skip ahead a bit.
Don't forget the slow part.

On the fifth day of Beermas, my true love gave to me

Five Cop-per Kettles,
Four Belgian Beers,
Three Fast Stoves,
Two Fertile Yeasts,
And a Lag'ring Re-frig-er-a-tor.
Finally, to the end. Sing along!
On the 12th day of Beermas, my

true love gave to me
Self-cleaning Bottles
Self-crushing Barley
Self-moving Carboys
Easy-Starting Siphon
Cornys Set for Kegging
Chillers Quick at Chilling
Brew Stores Never Billing
Five Cop-per Kettles
Four Belgian Beers
Three Fast Stoves
Two Fertile Yeasts
And a Lag'ring Re-frig-er-a-tor

That's the whole thing! Happy Beermas from the entire gang here at BYO.

nate Systyms &



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DOG BYO 12/9

# **Brewing the Old-Fashioned Way**

# Nancy Reynolds Ypsilanti, Mich.

My favorite outfit for brewing is an 18th century reproduction costume. I was looking for an interesting historic craft to demonstrate at local museums. What could be more interesting than beer brewing? As a colonial housewife, I would have made beer for the entire family. Mmm, the good ol' days.

This outfit encourages me to expand my brewing ingredients. In the colonial tradition hops and barley become optional. Pumpkin, sage, ginger, blue spruce, and molasses were common ingredients and added some real flavor to a good brew.

The best part about brewing in this costume is meeting the visitors who come to the museum. It's amazing how many people will stand around an open fire on a hot day waiting for a hot

break. I learn more about the history and techniques of beer brewing from visitors than I could ever learn from a book.

An appropriate outfit for participating in a historic craft



# Tim Paine Austin, Texas

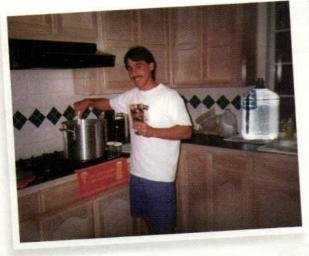
It's time for a good horse story. I went to Retama Race Park in San Antonio, Texas, with my fiancé. It was

opening thoroughbred night. We got there before the fourth race. After winning only a wimpy show bet the whole night, we were faced with the 10th and last race.

I opened the program to race 10 and immediately saw a horse named Idus P.A. I told my fiancé, "Gotta bet on this one." However, the previous race stats on IPA looked pretty bad, so I bet alone. The race started and none of my horses were near winning. Then, down the stretch, IPA somehow pulled outside and took it home as I was screaming "Go IPA."

IPA won at 23-1 odds so I broke even for the night, scoring \$48.60 for a \$2 bet. Gotta love it.

Moral: Never bet against beer!



Being a homebrewer pays off in its own way

# HOLIDAY TRADITIONS!

Do you toast the winter holidays with a specially made seasonal brew? Welcome the new year with a glass of homemade mead? Tell us about your winter traditions and send us a picture of yourself (and your family and friends) enjoying your holiday beverage. Include the recipe! There's a cool BYO T-shirt in it for you. Send your story to Holiday Brews, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at edit@byo.com. Be sure to include your mailing address!

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This is Sean. He's our beer guy.

Matter of fact, around Brew King, we call him "The Beer Guy". After all, he knows a thing or two about beer. And as you can see, he's pretty happy right now. Why? Because after months of self-imposed exile in Brew King's (windowless) brewing lab, Sean has emerged with

Wort Works, an of pure perfection standards. You see,

elite group of home

the ones that scoff at most insist on choice natural ingredients masterpieces. With Wort Works, all-malt brewing kit even by Sean's Sean belongs to that brewing purists commercial brews and for their own brewing Sean would never cut

corners. So what has Sean created? A totally unique, bag-in-a-box packaged product offering 9 litres (2 gallons) of concentrated wort made from 100% barley malt with naturally processed hops and

filtered Canadian water,

boiled in our brew kettle.

fully 1000 gallon Sean even insisted on including a special dry hop package for extra aroma and flavour. And true to form, his instructions are comprehensive, even with information on the specific

fellow homebrewers in that its user friendly, for beginners too. proud. Try Wort Works. you (and your friends)

ingredients used. Sean's no dummy. He made Wort Works with his mind, but he also made sure no-boil method would be perfect Keep Sean happy. Make his Mom The results will make happy too.



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# Safe Soda

Dear Brew Your Own,

The root beer article and recipe (Recipe Exchange, October '97) beautifully illustrates the renaissance of craft-brewed sodas. It neglects to mention, however, one important point regarding the use of specialty herbs in brewing. While many people have no misgivings about using sassafras bark as an ingredient in homemade sodas for personal use, its use is strictly prohibited by the FDA in any commercial product. In fact including this product in a

published recipe without disclaimer

is to court disaster.

We initially wanted to introduce birch bark extract and safrole-free extract of sassafras (sassafras with the carcinogenic portion removed) but found the concentrated extracts too difficult to work with and lacking in the flavor and aroma profiles that made them desirable. While we intend to add new herbal selections to our product line in the future, sadly sassafras in any form is not likely to be one of the items.

Fred Czuba Steinbart Wholesale Portland, Ore.

# Priming for Stout

Dear BYO,

In "Oatmeal Stout" (October '97) the recipes do not include sugar for priming. Is this standard for oatmeal stouts? I have seen other stout recipes that call for priming and I just wanted to make sure this recipe did not need it because I wanted to try it out. It sounds like a great brew.

Mike Harp Lansing, Mich.

The oatmeal stout, like all other beer styles, must indeed be carbonated. Carbonate by any of the standard methods. If priming, use <sup>3</sup>/<sub>4</sub> cup of priming sugar for a five-gallon batch.

# Surfin' the Brews

Dear BYO.

I just received my newest issue of

your magazine and
was disappointed not
to see one of the best
beer sites on the Internet
listed. My favorite is the
Ultimate Beer Guide at
beer.meccanet.com.

Mia Strong Manahawkin, N.J.

# Too Much Wheat

Dear BYO.

I was excited to see my Oktoberfest recipe in the October '97 Recipe Exchange. Thanks for including it. However, there was a "big" error in it. It should have read 0.5 pounds of wheat malt, not five pounds. I hope the missing decimal doesn't cause anyone problems.

David Siemen Spring Lake, Mich.

# Calculating Strike Temperature

Dear BYO,

As a homebrewer and engineer I especially enjoy the technical aspects of the articles in BYO. This magazine lives up to its name and is truly a practical resource for the homebrewer.

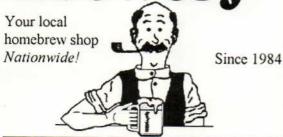
The equation for calculating the strike temperature for mashing ("Feel the Heat," September '97) is a great tool, although I found a minor error in the application of this equation. To calculate the weight of water (W), the volume in gallons should be multiplied by the conversion factor of 8.3 pounds per gallon of water rather than 8.5 as shown (although this doesn't make much of a difference since the resulting change is less than one degree in all cases).

Scott Glass Mt. Pleasant, N.C.

# Correction

Our feature on 175 Homebrew Kits (October '97) incorrectly labeled Brew House all-grain wort kits as "concentrated wort kits." The kits are not concentrated; it is not necessary to add water.

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# The Godfather of Beers

by Scott R. Russell

always got a chuckle from the postcard that used to hang on the front of my refrigerator. A friend had decided to get engaged, and the announcement we got was a card with a picture of a couple on a balcony, with the Eiffel Tower in the background, throwing a pig off into the air. The caption read something about love in Paris being a case of "throwing cochon to the wind." (Cochon is the French word for pig.) A worthy lesson to learn, I think. Sometimes you just have to let go of scruples, traditions, guidelines, acceptability. This can come out as either "the hell with it" or "go for it!" Either way, you're at the top of the roller coaster and the only way to get back to the ground is to ride along.

This, then, is one of those stories. I had an irresistible urge (I get a lot of those, to be honest, usually involving a catalog and a credit card) to create something so different, so unusual, so completely unique as to make a

statement that would be heard around the world. Well, like most of those urges, the initial enthusiasm faded to a scrap of paper tacked to a section of my bulletin board where great ideas go to hibernate. Until a fateful day during the winter of 1995 (I think).

The bulletin board got moved to a different wall, the scraps of paper sharing one red pushpin fell off in transit, and of course they were read before being put back on. And here was an outline of a recipe that had never made it to the brewhouse. That long ago, it had started as an extract recipe with some small quantity of specialty grain. A reddish amber brew, devilishly seasoned with, get this, pizza spices. Why not? Oregano, garlic, basil, fennel seed, chili pepper. Everything but anchovies. I guess when I thought it up the first time, I didn't have the nerve to brew it. Upon

rediscovering the recipe, however, I got out my calculator and reconfigured it as an all-grain recipe, toned down the spices to "subtle," added back the hops I had originally eliminated, and voilà.

One steamy February day, Don Corleone's Special Ale came to be. I can't pretend everyone who tried it loved it. Reactions were decidedly mixed, from the skeptics who didn't even get the glass within a foot of their mouths before saying "no thanks" to the gung-ho, "I'll try anything" grabbing and guzzling of the enthusiasts. It didn't really go well with pizza, after all, either.



# Don Corleone's Special Ale (5 gallons, partial mash)

# Ingredients:

- · 2 lbs. two-row pale malt
- 1 lb. amber malt (or brown malt)
- 1 lb. medium crystal malt, 40° to 60° Lovibond
- 4 lbs. unhopped amber dry malt extract
- 1 oz. Willamette hop pellets (5% alpha acid), for 60 min.
- 2 small cloves (not whole heads, please!) fresh minced garlic
- 1 very small dried chili pepper (ancho, habañero, tabasco)
- 20 or 30 fresh whole fennel seeds
- A pinch each of dried (not ground) oregano, basil, thyme. Other favorite pizza spices may be added.
- 10 to 14 g. dry ale yeast or a liquid such as Wyeast 1056 (American ale)
- 7/8 cup corn sugar for priming

# Step by Step:

In 1.5 gal. of water heated to 164° F, mix crushed pale, amber, and crystal malts. The mash should stabilize near 151° F. Hold 90 min., sparge with 2 gal. of water at 168° F, and collect the runoff in your boiling kettle. Add the dry malt to the kettle and bring to a boil. Add the Willamette hop pellets, boil 60 min., remove from the heat, and add the garlic and spices. Let sit for 30 min. covered. Chill, aerate, and top off in your fermenter to 5.25 gal. with preboiled, chilled water. Pitch yeast when wort cools to 70° F, seal, and ferment at 65° to 70° F for 10 days. Rack to secondary and condition at 60° F for two weeks or more. Prime and bottle. Age three weeks in the cellar.

# **Alternatives**

My original recipe would have used 6 lbs. of amber unhopped dry malt with 1/2 lb. medium crystal and 1/2 lb. amber malt steeped in the brewing water beforehand. An allgrain formulation would increase the pale malt to 8.5 lbs. in 3 gal. of mash water and 15 quarts of sparge water. In either case the rest of the recipe would remain the same. If you use a different combination of spices in your pizza sauce, by all means try it. I can't see how to do it, but somewhere in here there's room for sundried tomatoes, mushrooms, maybe green pepper, or even (dare I say it) pineapple.

Redundant. But it was good as a side dish to accompany grilled cheese sandwiches, hot dogs, bagels with cream cheese. Try it, you'll like it!

# **Reader Recipes**

American IPA Style (5 gallons, extract and specialty grains)

Hoppy, with a good malt flavor. Full of citrus aroma and body.

> Eric Chang and Steve Bruce San Francisco Brewcraft

### Ingredients:

- 9 lbs. Alexander's pale malt extract
- 2 lbs. crystal malt, 40° Lovibond
- · 2 lbs. cara-pils malt
- 1.5 oz. Chinook hops (10.5% alpha acid), for 60 min.
- 1.75 oz. Cascade hops (4% alpha acid), 1.25 oz. for 10 min., 0.5 oz. for dry hopping
- 1.75 oz. Centennial hops (10.6% alpha acid), 1.25 oz. for 10 min., 0.5 oz. for dry hopping
- Wyeast 1056 (American ale)

• 3/4 cup corn sugar priming

### Step by Step:

Steep specialty grains in 2 gal. of water as it heats up. Remove grains and add extract and Chinook hops. Boil for 50 min. Add 1.25 oz. each of Cascade and Centennial hops and boil 10 min. more. Total boil is 60 min. Cool, add to cold water to make 5.25 gal. Pitch yeast at 75° F and primary ferment between 68° and 72° F for one week. Add 0.5 oz. each of Cascade and Centennial hops in secondary. Hold at 68° F for two weeks. Bottle with corn sugar or keg.

# Belgian Spicy Half-Wit (5 gallons, extract and specialty grain)

I wanted to brew something like I've never brewed before. It is different.

Roger Krafve Brew by You Homebrew Minnetonka, Minn.

# Ingredients:

- · 6 lbs. light malt extract
- 1 lb. wheat dry malt extract

- 1 oz. Cascade hops (3.5-4% alpha acid), for 45 min.
- 1 oz. Brewer's Gold hops (7.3% alpha acid), for 30 min.
- 1 oz. Spalt hops (5.5% alpha acid), for 5 min.
- · 4 oz. whole coriander
- 1/2 tsp. clove
- 1/2 tsp. cinnamon
- 1/2 tsp. nutmeg
- 1/2 tsp. allspice
- Wyeast 1214 (Belgian ale)

# Step by Step:

Boil 2 gal. of water. Remove from heat and add extracts and Cascade hops. Boil for 15 min. and then add Brewer's Gold hops. Boil 25 min. more and add Spalt hops and spices. Boil 5 min. more for a total boil of 45 min. Top up to 5 gal. Pitch yeast at 80° F. Primary ferment at 72° F for five to seven days. Secondary ferment at 72° F for seven to 10 days. Bottle as usual. Drink after three weeks. Enjoy.

OG = 1.050

FG = 1.011

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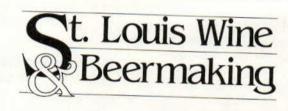
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# Centennial Red (5 gallons, extract and specialty grains)

An outstanding garnet-colored ale with solid body and hearty hoppiness. A favorite at Oahu Homebrew Supply.

Dave Campbell Honolulu, Hawaii

# Ingredients:

- 8 lbs. Alexander's light extract syrup
- 14 oz. crystal malt, 80° Lovibond
- · 2 oz. chocolate malt
- 2 oz. Centennial hops (10.6% alpha acid), 1.5 oz. for 60 min., 0.5 oz. for 30 min.
- 2 oz. Cascade hops (4.4% alpha acid),
   1 oz. for 10 min., 1 oz. steeped at end of boil
- Wyeast 1056 (American ale)

# Step by Step:

Steep grains at 160° F in 2 to 5 gal. of water for 20 min. Bring to a boil and add extract and 1.5 oz. Centennial hops. Boil for 30 min. and add 0.5 oz. of Centennial hops. Boil 20 min. and add 1 oz. Cascade hops. Boil 10 min.

more. Add remaining 1 oz. Cascade hops, turn off heat, and steep. Total boil is 60 min. Top up to 5 gal. with cold water. Pitch yeast. Primary ferment at 68° F for one week. Secondary ferment for two weeks at 68° F. Bottle.

# American Pale Ale (5 gallons, extract and specialty grains)

American pale has enjoyed a resurgence in the past decade as a paler, hoppier version of its English predecessor.

Ryan Nagle Merchant of Vino Ann Arbor, Mich.

### Ingredients:

- · 4 lbs. Alexander's pale malt extract
- 3 lbs. Muntons light dry malt extract
- 0.5 lb. Hugh Baird crystal malt, 30° to 40° Lovibond
- 3.5 oz. Cascade hop pellets (4.3% alpha acid), 3 oz. for 60 min., 0.5 oz. for 2 min.
- Wyeast 1056 (American ale)
- 3/4 cup corn sugar for priming

### Step by Step:

Prepare yeast starter three days before brewing to ensure minimal lag time. Add a grain bag of crystal malt to 2 gal. of preboiled cold water. Bring to a boil over the course of 30 min. Remove grains when boil starts. Add malt extracts and 3 oz. Cascade hops. Boil for 1 hour. Add finishing hops for 2 min. Add it to 3 gals. of preboiled, chilled water in primary. Pitch yeast at 70° F and ferment for seven days. Ferment in secondary for five days. Add corn sugar for priming and bottle.

# Wedding Bell Brown (5 gallons, all-grain)

I used to be brewmaster at San Andreas Brewing in Hollister, Calif. I have stayed friends with the gang over there, so I asked them if they would brew up a batch of special beer for my wedding.

We adapted my homebrew brown ale five-gallon batch and made 14 barrels. We kegged some for the



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# Recipe Exchange

reception and bottled a bunch as party favors.

Mitch Steele Valley Park, Mo.

#### Ingredients

- 6 lb. English mild malt
- 3.5 lb. pale malt
- 8 oz. caramel malt, 40° Lovibond
- 8 oz. caramel malt, 80° Lovibond
- · 4 oz. chocolate malt
- 5.5 g. (0.19 oz.) Centennial hops (15% alpha acid), for 60 min.
- 25 g. (0.88 oz.) Willamette hops (15% alpha acid), 5.5 g. (0.19 oz.) for 60 min., 13 g. (0.46 oz.) for 40 min., 6.5 g. (0.22 oz.) for 20 min.
- 6.5 g. (0.22 oz) Goldings hops (17.5% alpha acid), for 20 min.
- · Wyeast 1028 (London ale)

### Step by Step

Heat 3.5 gal. mash water to 167° F. Treat with Burton salt if appropriate. Crush grains and mash in. Target mash temperature is 156° F. Rest at this temperature at least one hour or until

iodine test is negative. Sparge with enough water to collect 6.5 gal. wort. Bring to a boil. When boil has started, add the Centennial and 5.5 g. Willamette hops. Boil for 20 min. Add 13 g. Willamette and boil for 20 min. more. Add the Goldings and the rest of the Willamette hops and boil 20 min. more. Total boil is 60 min. Chill and pitch yeast. Ferment out and keg or bottle according to your usual routine.

# Bell Faire Mead (5 gallons)

I brought this mead to a friend's wedding shower. It seemed appropriate considering its reputation for increasing a couple's fertility. My understanding is that in Celtic lore, mead carries with it the reproductive proclivity of its makers — bees. I suppose an alcohol content approaching 14 percent also has something to do with it!

Mary Samuels Tenino, Wash.

### Ingredients

• 10 lbs. light-colored honey

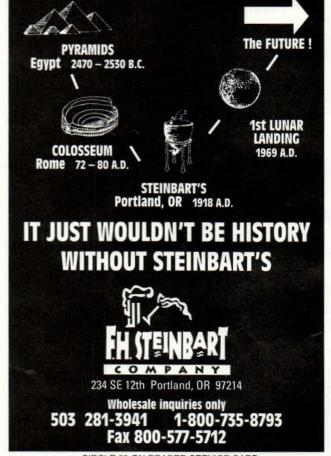
- · 4 Valencia oranges
- · 2 tsp. ground coriander seed
- Pris de Mousse wine yeast

# Step by Step

Combine water and honey to make 5.5 gal. of solution. Bring to a low simmer, around 160° F, and hold for 30 min. A layer of albumen "scum" will form during this process. Skim it off and discard it. Grate the orange zest (outside peel) from the oranges, avoiding the white, inner peel. Juice the oranges. Add the zest, juice, and coriander to the honey solution and continue simmering for 10 min. more. Chill must and pitch the yeast when the temperature is below 90° F. Ferment at room temperature four weeks, then rack to secondary fermentation for two more weeks. At the end of the six-week fermentation, put the mead in cold storage, as near freezing as possible, until it has cleared.

For still mead, bottle as is. For sparkling mead, bottle with ½ cup priming sugar, boiled in a cup of water or the fermented mead to sanitize. ■





CIRCLE 39 ON READER SERVICE CARD

# The 12 Degrees of Separation



I have successfully completed my first all-grain batch of beer. All in all the batch turned out pretty well. My converted 64-quart cooler/mash tun can maintain a temperature loss of two degrees per hour. My initial water strike temperature was 168° F, which provided a mash temperature of 156° F. The recipe called for a mash temperature range of 152° to 154° F. I added enough cold water to get the temperature down to the required range, which meant diluting the mash. Is there a good rule of thumb or formula available that can help determine the strike temperature needed to achieve a final mash range?

> David Glunt Rocky Mount, N.C.

use a simple rule of thumb for this problem. The rule is simply to add 12° F to your desired mash temperature to determine the strike temperature. In your brew you used 168° F strike water and your mash temperature was 156° F. The rule worked!

This rule, like all others, has limitations. The 12° F rule only works if three conditions are met. The first is that the weight ratio of water to malt is three to one. Simply use three liters (which is the same as three kilograms) of water for every kilogram of malt. (Or 1.44 quarts of water per pound of malt.)

The second condition is the malt must be at 68° F (20° C). The third condition is that the mash tun must be pre-heated to the mash temperature. This eliminates a cool mash tun robbing energy intended for the mash and a very hot mash tun from heating up the mash to temperatures higher than that anticipated. If all three conditions

are met, then the rule works well.

Of course not all mashes conform to these three conditions and there are more flexible calculations available. The most basic calculation is based on an energy balance. An energy balance states in mathematical terms that no energy is gained nor lost when two systems are mixed. An energy balance for this problem looks like this:

 $(MC_p\Delta T)_{malt} = (MC_p\Delta T)_{water}$ 

M = mass in kilograms C<sub>p</sub> = specifc heat in 1/Kilogram x Kelvin

Kelvin  $C_{p \text{ malt}} = 1.8/\text{Kg x Kelvin}$   $C_{p \text{ water}} = 4.2/\text{Kg x Kelvin}$   $\Delta T = \text{temperature change in Kelvin (or °Celcius).}$ 

If you play around with this calculation, you can verify the 12° F rule.

On a lighter note, if I were following a recipe that called for a 152° to 154° F mash and hit 156° F, I wouldn't worry about it! An infusion mash that is anywhere between 148° F and 158° F will work fine and the flavor difference between the

extremes will be fairly insignificant compared with the overall flavor profile of the beer. If you were trying to repeat a beer you had made in the

past my advice would be different, but for a first-time attempt at a recipe I wouldn't worry so much.

Mr. Wizard

Any ideas where a person can buy a beer filter that can get close to one-tenth of a micron? I've come to the conclusion that the only way to drink beer is not

having to worry about sediment in the bottom of the bottle. Cold refrigeration and then filtering makes a quick, beautiful brew. Homebrewing done the way it's supposed to be done never quite completely gets rid of a yeasty taste to varying degrees. Any information on where I could purchase some of this equipment? I never have done this myself.

Cliff Johnson Vancouver, Wash.

here are many suppliers of beer filters that are designed to remove yeast and haze materials commonly found in beer. In fact many of them advertise in this magazine. The best place to find these types of filters is in homebrewing magazine ads and in homebrew supply stores.

To be honest, however, I don't believe a 0.1-micron filter is the best choice for homebrew or any other beer. Since yeast cells range in size from five to 10 microns, a five-micron filter works well for removing yeast. If you want to remove some of the non-veast haziness from beer, cold filtration with a one-micron filter works very well. And if you want to remove bacteria from beer, the accepted size for sterile filtration is 0.45 microns. I would rather not sterile filter homebrew because it is not intended to be shipped, stored in hot warehouses, and sold in grocery stores like commercial beer and thus really doesn't need sterile filtration. I do like clear beer, and when I filter I typically use a filter between one and two microns and filter the beer at about 32° F.

It sounds like you have had good luck with filtered homebrew but have had less success with unfiltered homebrew. Unfiltered homebrew doesn't have to taste yeasty if it is handled properly. The best way to minimize yeasty flavors is to allow

# Mr. Wizard

most of the yeast to settle from the beer before bottling. This is best accomplished if you chill the beer for several days before bottling. Beer treated in this fashion can be as clear and clean tasting as filtered beer.

After bottling it is important to keep the beer cool so that the yeast in the bottle doesn't begin to autolyze and produce those nasty flavors.

# Mr. Wizard

I am wondering what the "Widget" does inside a can of Guinness. The blurb on the can just says something about enjoying Guinness as if it were straight from the tap. I surfed Guinness' home page and couldn't find any useful information about the Widget. I really want to know what it does and how it does it. Is it a patented device, or is it inside other cans that I have not noticed yet?

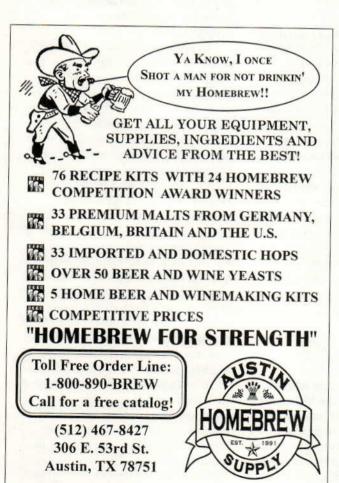
> Greg Henry Tacoma, Wash.

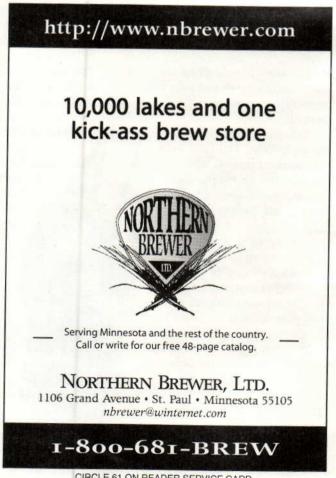
or those of you who have read this column over the years, it is no secret that I am quite the admirer of beer foam. A rich, creamy froth leaving marks like annular rings right to the bottom of the pint is a thing of beauty. There are few beers in the world that have a foam like a stout, such as Guinness, served on mixed gas. A diehard stout drinker will be careful not to rotate his glass during the period between the first and last swallow and will leave a trace of his drinking progress. Some may take 20 sips to polish a pint and others may knock off a pint in only five hearty gulps — these drinking traits are left behind on the glass like clues of a mystery. Foam is a very good thing indeed!

The story of the Widget began more than 50 years ago when Guinness cask conditioned all its stout and porter. Guinness realized that oxygen was causing its fine beers to spoil. The company decided to keg all beers in conventional kegs and do

away with cask conditioning because the traditional method allows air to enter the keg during dispense. The initial experiments produced beers with relatively poor foam and led the researchers at Guinness to discover that nitrogen was very important to the rich foam of the cask-conditioned beers. The air in the cask beers was not all bad. On one hand it oxidized the beer and let aerobic spoilage bugs grow, such as acetic acid bacteria. But the nitrogen gave the beers a rich, creamy froth.

This fact led to the first beers gassed with a mixture of carbon dioxide and nitrogen. Finally, Guinness had to invent a new type of beer tap that would simulate the effect of the beer engine used with cask ales. Since beer engines are equipped with "sparklers" that froth the beer before leaving the beer tap, Guinness put a sparkler-type device in its tap. This technology has changed with time, but the modern Guinness tap retains most of the design parameters first considered





more than 50 years ago.

Other brewers have followed suit with this type of beer dispense. In Ireland, Murphy's and Beamish use very similar methods to serve their stouts, and countless other brewers have used this wonderful technique worldwide.

I don't know why, but the minds at Guinness decided that they should develop a take-home package capable of producing the same great pint of Guinness as that from a bar tap. The Widget was born out of this need.

Inside every can of Guinness is a small plastic device, the Widget, that begins its journey empty in the bottom of an empty beer can. The can is filled with beer and a small volume of liquid nitrogen is dropped onto the surface of the beer immediately before the can is closed with a lid. The liquid nitrogen expands inside the beer can and forces beer into the Widget.

When the can is finally opened, beer is forced through a tiny hole in the Widget. As the beer passes through this hole, gas "breaks out" of the beer due to a rapid pressure drop through the tiny hole. What happens next is a cascade effect — tiny bubbles make more tiny bubbles, and these tiny bubbles make even more tiny bubbles.

The difference between mixed-gas beer and normal beers is the nitrogen. The bubbles in Guinness are primarily nitrogen, not carbon dioxide, and are much more stable. That is they don't break as quickly as carbon dioxide bubbles. Also, there is much less nitrogen in mixed-gas beers than carbon dioxide in normal beers. This is why Guinness doesn't foam all over the floor when the can is opened. If Budweiser were canned like Guinness, it would be a time-bomb waiting for some sucker to open the can. He'd have 14 ounces of Bud foaming out of the top of the can like froth from the mouth of a rabid dog!

The Widget is patented but like all other patents has been slightly changed by other companies to make a different design, which in turn gets patented. Most of the major brewers in the United Kingdom have Widgetlike devices for draft-style canned products. Competitors created these devices due to the immense success of the original design by Guinness. Boddington's Pale Ale, Greene King Abbot Ale, Murphy's Stout, Beamish Stout and, not to leave out the inventor, Guinness Pub Draught Stout are examples of beers on the US market using the Widget technology.

I would like to see some of the larger craft brewers in this country begin canning beer with Widgets or, like one version of Murphy's Stout with a Widget in the bottle, bottling Widget beers. I love Widgets because they make foam, and I like foam. What's good for foam is good for me!



I have been told that my fine liquors are absorbing lead from the beautiful 24

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percent leaded-crystal decanters in which they are stored. Further, I was told that I may be getting lead poisoning from drinking these distilled spirits. Could this be true?

> Dan Vail St. Petersburg, Fla.

eaded crystal drinking vessels are among the many ironies of wealth. Although often

exquisite works of art and a symbol a very poor choice as beverage containers, because all beverages stored in leaded crystal pick up lead ions. The main factor affecting the amount of lead pick-up is time. Since decanters used to store fine liquors are not emptied very rapidly, leaded crystal is an especially poor material choice.

of success, leaded-crystal glasses are

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Unacceptably high levels of lead have been found in distilled spirits stored in leaded-crystal decanters, milk put into leaded-crystal baby bottles, and assorted beverages put into leaded-crystal drinking glasses. According to Irene Kessel and John O'Connor in their recent book, Getting the Lead Out: The Complete Resource on How to Prevent and Cope With Lead Poisoning, leaded crystal should not be used on a regular basis for consuming any type of beverage.

The effects of lead on the development of childrens' brains, IO, and behavior has been widely publicized in recent years and has led (no pun intended!) to concern over lead-based paints, lead-contaminated soils, and lead in the drinking water. Since lead accumulates more rapidly in the bodies of infants and children than in the bodies of adults, exposure during youth is of particular concern.

However, adults are also negatively affected by lead. High blood pressure, kidney malfunction, infertility, loss of hand coordination and strength, peripheral nerve damage, hearing problems, and anemia are some of the manifestations of lead poisoning in adults. The adult populations at highest risk are those that are exposed to lead regularly, such as construction workers, painters, and workers in battery, plastics, smelting, insecticide, and electronic-component plants. This doesn't mean that lead from beverages is any less of a risk. Remember that lead foil on wines sold in the United States was banned a couple of years

The bottom line is this: Store your scotch, bourbon, or cognac in the bottle it came in or a nice glass decanter. Forget about using leaded crystal.



I am an extract brewer who always brews using specialty grains. Most often I steep these grains just as the recipe suggests. My uncertainty begins when I see so-called "partial-mash" recipes that ask for the steeping of grains such as Munich, wheat, or pale malts. I thought these grains needed complete mashing. Does the wort collected from

steeping these types of grains go
through some sort of conversion in the
boil with the extract, or are these grains
simply used for their additions to body,
color, taste, and aroma without contributing substantial fermentables to the
wort? I have tried mashing this small
amount of grain but wonder if it is worth
the extra trouble. Is this something I
should be concerned with, or am I just
being grainal retentive?

Scott Hay-Roe Volcano, Hawaii

ou are justified in your concern that steeping these malts may not be quite enough treatment. All the malts in your question contain starch and enzymes and require mashing to convert the starch to fermentable sugars. These malts can be used by simply steeping them, but the resulting wort will contain starch — neither boiling nor a 15-minute steep will convert the starch. Starchy worts can cause hazy beers and increase the risk of

microbiological spoilage, because some beer spoilage organisms can digest starch left over by yeast at the end of fermentation.

Many of the practices used by homebrewers are unconventional but do not prevent the brewing of greattasting beers. This is one of those practices. I would not use this method, but many do and it works. If I were using malts such as pale, Munich, and wheat in a partial-mash recipe, I would mash these grains using 1.5 quarts of 165° F water for every pound of malt. I would also allow the mash to rest at 150° to 155° F for at least 45 minutes before collecting the wort and sparging. This is somewhat of a pain in the mash! If you go to all that trouble to use a couple pounds of malt, you may as well go for it and mash all your malt. This, of course, requires more equipment.

The malts that do not require mashing are any type of crystal or caramel malt and the wide assortment of roasted malts. Names such as crystal, caramel, carastan, cara-Vienne, cara-Munich, cara-pils, Special B, brown, chocolate, black patent, and roasted barley can all be steeped in partial-grain brews. Either they have converted starch, in the case of the crystal-type malts, or the starch has been thermally degraded, as is the case with the roasted malts.



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

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

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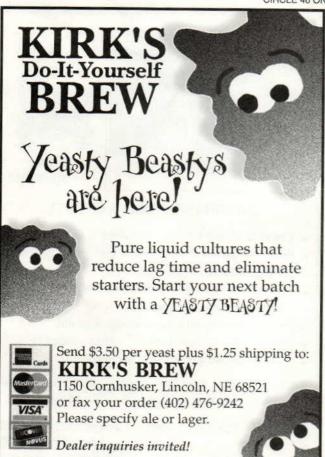
ChatSpot also offers Boards. A Board has a unique URL and a customizable interface. In addition, Board operators have the freedom to create unlimited Conferences.

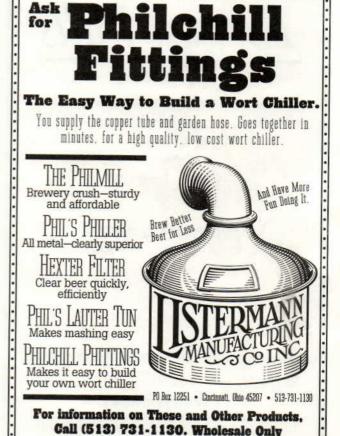
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CIRCLE 46 ON READER SERVICE CARD





# The Simple Keys to Open Fermentation

by Suzanne Berens

Brewer: Alan Kornhauser
Brewery: Portland Brewing Co.
Years of experience: 23
Education: Brewing and malting
courses at the United States Brewers
Association; microbiology certificate
from Siebel Institute of Technology;
other professional courses

House Beers: MacTarnahan's Amber Ale, Original Honey Beer, Zigzag Lager, Haystack Black Porter

The basic benefit of open fermentation is that there is no pressure on the vessel. The benefit of no pressure is that the yeast will work better. The higher the pressure the slower the fermentation. Pressure tends to retard the yeast metabolism. Lack of pressure gives you a higher percent of live cells, resulting in quicker fermentation.

The other real advantage is that you can see how well your fermentation is going. You learn to know how your fermentation is supposed to look. If it doesn't look like what you're used to, you know something is wrong.

Open fermentation also reduces your risk of volatiles. Sulfur dioxide levels are an issue in producing beer. If you have beer trapped in a tank, all those volatiles that are produced tend to be retained in the tank and stay in solution a lot more. When exposed to the atmosphere in an open fermenter, those volatiles have a place to go. Whatever it is you're producing that's undesirable, you have a much greater chance of driving it off than you do in a closed fermenter.

Why doesn't anyone do this in the real world? Because the fermenters are hard to clean. You have to do them by hand. If you put a spray ball inside your

Portland Brewing Co.



"There's no trick to open fermentation. It just sits there and does its thing.

The most important aspect is sanitation, sanitation, sanitation."

Alan Konhause

Brewer: Alan Kornhauser

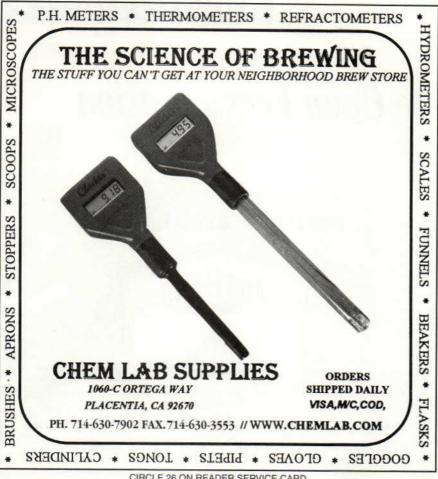
open fermenter, your caustic solution is going to fly all over the room and in your face. Obviously with a closed tank you cycle it through with a pump.

The other major drawback is the chance of contamination. To reduce chances of contamination, you should probably filter the air that goes through the room. This is difficult if you are

homebrewing. You should just ferment in a room that is very, very clean. If you are going to do it in a basement that is full of mold, that mold flavor is going to end up in your beer. Be very conscious of mold growth on the walls, floors, and ceilings. Scrub the ceiling, preferably with bleach. Sometimes people forget to look up and see what the ceiling looks

# The Tips

- Get to know what your fermentation looks like. Different shaped fermenters produce different looking fermentation.
- Ferment in a room where the air is clean. Make sure to check the walls,
- floors, and ceilings for mold.
- Use a container that is not porous, one that does not retain bacteria.
- Aerating your wort well is critical to making yeast that will ferment well the next time you open ferment.



CIRCLE 26 ON READER SERVICE CARD



Tips from the Pros

like. It's also important for the fermenter to be in an area with adequate ventilation. Ventilation will help reduce contamination and prevent the buildup of carbon dioxide and volatiles that escape during fermentation.

The best container to use is one that is not porous at all so that it is easy to clean and won't retain bacteria. Shape will affect fermentation. Anheuser-Busch has done a tremendous number of studies on shapes of fermenters vs. the flavors they get. (A-B doesn't) feel they can get the same flavors out of different shaped fermenters. The greater the depth of the fermenter, the higher the pressure on the yeast at the bottom of it. So you get some of the problem of pressure. The more shallow the fermenter, the fewer problems you have. In an ideal world you'd want a completely round fermenter. Then you wouldn't have any corner surfaces that would be difficult to clean. But for a homebrewer it's not really an issue because you are using such small quantities. Glass would be the easiest surface to clean. We in the brewing industry love stainless because of its inertness - it won't impart flavors - and its ease of cleaning. If you ferment in mild steel, your beer will taste like a bucket of nails.

Different shaped fermenters tend to produce different looking fermentations. If there's a trough in the bottom of the fermenter, this trough is mirrored by a bump in the foam on the top of the fermenter. It is not a good or a bad thing; it's a thing. You just want to get to know what your fermentation looks like.

Another aspect to keep in mind is aeration. You can get by with splashing the wort as it goes into the fermenter and causing it to bubble. It's not a good practice because of the other bad things you'll do to the wort. Every time you make the beer foam, that's less foam you'll get in the glass. We inject sterile air into the line as it's going into the fermenter. Aerating the wort is critical to making yeast that's going to ferment well the next time. If you've got yeast that has been aerated well, you don't need to aerate the wort. It will ferment one time, usually pretty well, without aeration. If you subsequently try to collect that yeast to get it to ferment after that, good luck. The problems of aeration are cumulative.

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# Mastering a Robust Porter

by Alex Fodor

Porter was designed with economy in mind. In 1722 brewer Ralph Harwood created a brew he called "entire" to replace the three-beer blend that dominated London pubs. Publicans who once poured a mixture from three casks could now serve the entire beer from one cask.

The name entire eventually became synonymous with porter, a title taken from the beer's favorite tipplers. Much to the chagrin of brewers who wish to imitate Harwood's brew, the details of his recipe are unknown.

The original porter may have been a blend of three worts or a mixture of three beers. Brown malt, the dominant malt of the day, accounted for the bulk of the extract. As the result of high kiln temperatures, brown malt was probably medium to dark in color, highly flavorful, and low in enzymes.

Reflecting this, early porters would

have been a deep ruby color, with the possibility of malty, toasty, and even smoky flavors from the malt.

Hops were most likely added at the start of the boil, leaving little hop character and a notable residual bitterness. A certain degree of souring by bacteria or wild yeast was no doubt a perceptible component

of these brews, which were often aged in wooden vats for several months.

Porter marked the beginning of the demise of British pub brewing 250 years ago. As the official beer of the British industrial revolution, porter became popular at a time when cities were bursting with people and large breweries were learning the financial advantages of brewing in bulk.

The small-pub brewers could not keep up, and many were forced out of

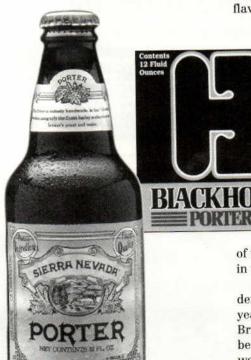
business. To meet demand in the early 1800s, large brewers began mass producing porter at rates as high as 300,000 barrels a year. With far too much beer to handle in barrels, brewers built wooden vats to store their beer. This resulted in cask warfare.

Porter brewers competed to make the largest beer vat. In 1795 one brewer built a vat that held 20,000 barrels. In 1814 a vat owned by the same brewer broke open, sending a flood of frothy porter throughout the surrounding buildings and killing eight people.

Meanwhile, advances in malting technology resulted in the production of a paler malt. Pale malt had a better extract yield than brown malt and so was more cost effective. With the invention of the roasting machine in 1817, brewers could make dark beers for less money by using a small portion of roasted malt along with a base of pale malt. This produced a version of porter much different than Harwood's but probably closer to the modern style. Porter's popularity continued to spread, expanding into Scotland, Ireland, and even the new world.

At the turn of the century, porter eventually fell out of favor in England as drinkers opened their palates and their pocket books to gin and pale ale. In Ireland dry stout became the mainstay of pubs. In the United States the influence of German brewers shifted beer drinkers' interests to lager. In modern times, however, the American craft beer movement and the British Campaign for Real Ale (CAMRA) have restored porter to its most-favored-beverage status among drinkers.

Modern versions of classic porter tend to rely on roasted malts to give them a color ranging from reddishbrown to black, usually falling near 30° Lovibond. Porters from Anchor, Sierra Nevada, Redhook, Boulder, and



England's Samuel Smith are some of the important modern versions that define the style. However, variation within the style remains.

Sierra Nevada's porter displays the distinctive hoppiness associated with its beers.

Anchor's porter is a rich, black beer with a notable roasted character.

It is not particularly encouraging to consider that 18th century porter also had many interpretations. On the other hand to say the style leaves some room for interpretation sounds like a homebrewing challenge. Still, some parameters should be observed to brew within the style. The original gravity should fall between 1.045 and 1.060 and drop to 1.010 to 1.015 by the end of fermentation. Porter tends to have enough bitterness to balance the roasted note. An IBU in the realm of 25 to 45 is appropriate.

The percentage of alcohol in porter ranges from 4.8 to 6.1 by volume.

British pale is the malt of choice for the bulk of the grist. Crystal,

chocolate, and black

malts add complexity,
flavor, and color. An
infusion mash at
150° to 155° F is a
simple and effective
way to make porter.
Most hop varieties
work well in porter,
especially for bittering.
Aromatic hop

varieties such as Golding, Cascade, Fuggle, and Willamette are excellent choices for finishing. Several types of British-style yeast are available, and most should suit porter brewing. Wyeast 1098, British ale yeast, is a popular choice. If you prefer dried yeast, try Lallemand Nottingham yeast. Either way, only ale yeast contributes the estery profile desired in porter. The fermentation should be conducted at 60° to 65° F.

# Blue Last Porter (5 gallons, all-grain)

This brew takes its name from the first English pub to serve porter. The beer is dark and delicious with a touch of citrusy flavor from the Cascade hops. Raise your glass to the Blue Last.

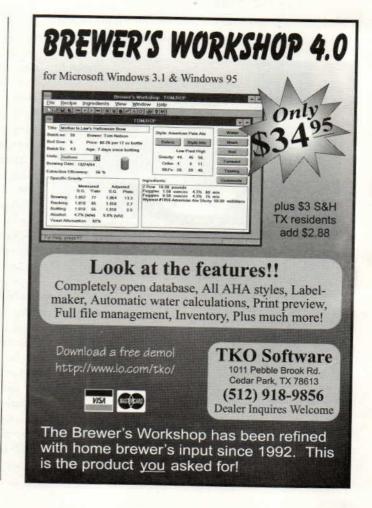
# Ingredients:

- 8 lbs. British pale ale malt
- 12 oz. crystal malt
- 12 oz. chocolate malt
- · 2 oz. black patent malt
- 0.8 oz. Northern Brewer hops (10% alpha acid), for 60 min.
- 1 oz. Cascade hops (5% alpha acid), at end of boil
- Ale yeast (such as Wyeast 1098)

# Step by Step:

Mash grains into 3.5 gal. of water to reach a conversion temperature of 153° F for 90 min. Sparge with water at 168° F until a volume of 6 gal. is collected. Boil for a total of 90 min. The first hop addition should be made 60 min. before the end of the boil.





Add the second addition as soon as the boil ends. Cool and aerate. Pitch yeast at 75° F. Ferment at 60° to 65° F. Rack off of yeast after fermentation and age for two weeks before bottling or kegging.

OG = 1.055

FG = 1.013

# Blue Last Porter (5 gallons, partial mash)

This is the Blue Last at half mast for those who prefer a partial mash.

# Ingredients:

- · 4.5 lbs. pale liquid malt extract
- · 3 lbs. British pale ale malt
- 12 oz. crystal malt
- · 12 oz. chocolate malt
- · 2 oz. black malt
- 0.8 oz. Northern Brewer hops (10% alpha acid), for 60 min.
- 1 oz. Cascade hops (5% alpha acid), at end of boil
- Ale yeast (such as Wyeast 1098)

# Step-By-Step:

Mash grains into 1.5 gal. of water to hit the conversion temperature at 155° F for 60 min. Sparge grains with 168° F water to collect 4 gal. of wort. Add 2 gal. of water to the wort, making a total of 6 gal.

Heat to boil while stirring in malt extract. Boil for a total of 90 min. The first hop addition should be made 60 min. before the end of the boil. Make the second addition as soon as the boil ends. Cool and aerate. Pitch yeast at 75° F. Ferment at 60° to 65° F. Rack off of yeast after fermentation and age for two weeks before bottling or kegging.

OG = 1.055FG = 1.013

# **Blue Last Porter**

(5 gallons, extract with specialty grains)

Enjoy a brew that's good to the last without the bother of the mash.

#### Ingredients:

- 3.5 lbs. pale liquid malt extract
- 3 lbs. dried light malt extract
- 1 lb. crystal malt
- 12 oz. chocolate malt
- · 2 oz. black malt
- 0.8 oz. Northern Brewer hops (10% alpha acid), for 60 min.
- 1 oz. Cascade hops (5% alpha acid),

for end of boil

· Ale yeast (such as Wyeast 1098)

# Step by step:

Immerse crushed grains in 2 gal. of water at 155° F for 30 minutes. Strain out grains and rinse with 2 gal. of 165° F water to make a total volume of 4 gal. As the wort approaches boil, add malt extracts while stirring to dissolve. Boil for 60

min. Add first hop addition as soon as boil starts. Add last hop addition when the boil ends. Cool and aerate wort. Add 1.5 to 2 gal. of cool water to bring the volume to 5 gal. Once the wort has cooled to 75° F, add yeast. Ferment at 60° to 65° F until finished. Age for two weeks in the secondary before bottling or kegging.

OG = 1.055 FG = 1.010-1.015 ■

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- · Scotmalt (Scotland)
- Briess (U.S.)
- Golden Promise, Chariot, Specialties and Organic

Belgian items also available!

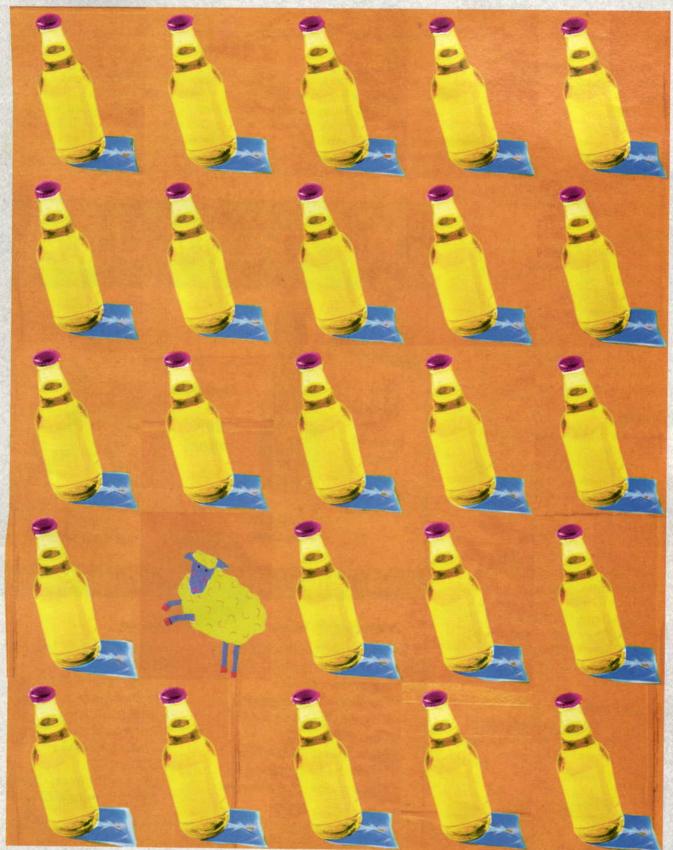
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CIRCLE 80 ON READER SERVICE CARD



CHRISTINE KELL

# CLONING: It's not just for sheep!

Duplicating a commercial beer challenges a brewer's skills. It requires a knowledge of ingredients and flavors, along with the ability to accurately evaluate the beer's qualities. In "Clone Your Own" (July '97 BYO) we published clone recipes for a bandful of classic beers and some tips for creating your own clones. BYO readers answered the call, sending us their recipes for bomebrewed versions of popular commercial beers.

# Russian River Red

Alaskan Amber

# (5 gallons, extract with specialty grains)

Here's my Alaskan Amber Clone. I call mine Russian River Red. That's the Russian on the Kenai Pennisula, not the California river. Any good Alaskan should understand the name. The Russian is famous for its runs of Sockeye salmon, which Alaskans call "Reds." The folks that make the real thing say mine tastes real close. Some folks say it's better, but I didn't say that. William E. (Bill) Murray

Anchorage, Alaska

#### Ingredients:

- 1 lb. domestic crystal malt, 80° Lovibond
- 0.5 lb. carastan malt (34° Lovibond)
- 7.25 lbs. Alexander's Pale Malt

#### Extract

- 1 oz. Cascade hops (6% alpha acid), for 60 min.
- 10 g. (.35 oz.) Czech Saaz hops (real Czech Saaz — alpha acid content is irrelevant), for 6 min.
- 1 tsp. Irish Moss
- 1/2 tsp. gypsum if your water is on the soft side
- 1 L. starter of Wyeast 1007 (German Ale)
- 11/4 cups light DME for priming

#### Step by Step:

Steep the grains in a grain bag in 2.5 gal. cold water. Heat water to 156° F and hold for 20 min. Remove the grain bag and add the malt extract. Add water to make at least 6 gal. and bring to boil. Add the Cascade hops and Irish Moss and boil 54 min. Add Saaz hops and boil 6 min. more for a

total boil of 60 min. Cool to about 65° F and pitch the starter. Aerate well.

Ferment at 56° to 58° F. This is a slow fermentation. Figure on 14 days each for primary and secondary. Prime and bottle. Allow 7 days in the bottle for carbonation and then cold condition for three weeks.

OG = 1.057.

FG = 1.020 (yep, that high)

# Scotch Ale Maclays Scotch Ale (6.5 gallons, all-grain)

This is a full-bodied, malty brew with light hop undertones and well-rounded bitterness. It is also one of only 11 brews out of more than 300 that I have given 10 out of 10 in my tasting notes. It is one of my favorite beers and has taken about a year to get right. It is now somewhere close, but judge for yourselves.

Dave Pickett Greater Manchester, England

# Ingredients:

- 11.25 lbs. British two-row malt
- 3.5 oz. British crystal malt, 55° Lovibond
- 3.5 oz. wheat malt
- 1 oz. Fuggle hops (4.5% alpha acid), for 90 min.
- Scottish ale yeast such as Wyeast 1728 or Edme dry yeast (I use yeast recovered from King & Barnes bottled beers)
- 2/3-3/4 cup corn sugar for priming

#### Step by Step:

Mash malts for 90 min. with a single-infusion mash at 151° F. Sparge and recover 6 gal. Boil wort and add hops. Boil 90 min. Chill, aerate, and pitch yeast.

Ferment until done and keg or bottle as usual. Alcohol by volume is 5.2%.

OG = 1.054

FG = 1.014

# Wannabe Widmer Widmer Hefe-Weizen

(5 gallons, partial mash)

I threw this recipe together while

standing in the local brewing supply store and it came out surprisingly true to form. The only real flaw this brew had was the fact that it damn near evaporated once I got it into the keg.

> Doug Otto Carmichael, Calif.

### Ingredients:

- · 1 lb. cara-pils dextrine malt
- · 2.5 lbs. Munich malt
- 3 lbs. Alexander's weizen malt extract
- 1 oz. Cascade whole hops (6.0% alpha acid), for 45 min.
- 1 oz. Tettnanger hop pellets (4.3% alpha acid), at end of boil
- Wyeast 1007 (German Ale)
- 3/4 cup priming sugar

### Step by Step:

Use 4.5 qts. water with a pH of 5.3. Use a step mash with a protein rest for 30 min. at 126° F. Raise heat to 155° for amylase rest. Rest for 60 min. Mash out 5 min. at 168° F. Use 5 gal. water to sparge.

Bring to a boil, remove from heat, and add extract. Boil 15 min. and then add Cascade hops. Boil 45 min. more for a total boil of 60 min. At end of boil, steep Tettnanger hops. Cool, aerate, and pitch yeast.

Ferment seven to nine days in primary, seven to 10 days in secondary, and keg or bottle as usual. Alchohol by volume is 3.4%.

OG = 1.035

FG = 1.009

grain)

# Downtown Davis Brown Lost Coast Brewing Downtown Brown Ale (5 gallons, extract and specialty

I came up with a recipe several months ago at a customer's request for something similar to Downtown Brown Ale by Lost Coast Brewing in Eureka, Calif. I hadn't tried the beer before he asked for it, but based on his description and some hints at the ingredients from the Lost Coast Web page, I put it together the best I could. Well, the customer really liked it. Mt. Hood makes for an almost noble aroma hop, and the chocolatey, malty

body is very appealing.

Sean Mick Mick's Homebrew Supplies Davis, Calif.

### Ingredients:

- 3.75 lbs. Alexander's light malt extract
- 3 lbs. Laaglander light dry malt extract
- 0.5 lb. DeWolf-Cosyn chocolate malt, 350° Lovibond
- 0.25 lb. maltodextrin powder
- 0.5 oz. Chinook whole hops (13.5% alpha acid), for 60 min.
- 2 oz. Mt. Hood whole hops (4.5% alpha acid), 1 oz. for 30 min., 1 oz. for 10 min.
- 1 qt. starter of Wyeast 1272 (American II Ale)
- 3/4 cup corn sugar or 11/4 cup of light DME for priming

### Step by Step:

Steep grains for 20 min. in 0.25 gal. of water at 150° F. Strain liquid into main brewpot. Bring water volume to 2.5 gal. with carbonate water (add 1 tsp. chalk if using soft water). Bring to boil and add extract, maltodextrin, and Chinook hops. Boil 30 min. Add 1 oz. Mt. Hood hops and boil another 20 min. Add another 1 oz. Mt. Hood hops and boil 10 min. more. Total boil is 60 minutes. Remove spent hops and cool. Add to 2 gal. preboiled, chilled water in fermenter. Top up to 5 gal. with preboiled, chilled water. Cool to 75° F and add yeast.

Aerate wort. Equip fermenter with blow-off tube or airlock. Primary ferment lasts about a week at 68° to 72° F. Rack to secondary until clarified. Bottle with corn sugar. Carbonation takes about one week; beer matures in two weeks. Enjoy. Alcohol by volume is 4.7%.

OG = 1.048-1.050FG = 1.014

# **Nut Brown Ale**

Motor City Brewing Works Nut Brown Ale

# (Five gallons, extract)

This is the third time I've brewed this beer. I think I have it just right. Everyone thinks it is better than Motor City Brewing Works' version. The first time I brewed it I added five ounces of chocolate malt. Too strong tasting. The second time I added one-half pound Belgian Special B malt. This was very good but not like Motor City's. Three months later, the beer is even better!

Fred Goeldi Warren, Mich.

### Ingredients:

- Muntons Connoisseurs Range Nut Brown Ale kit (40 pints)
- 3 lbs. Muntons amber dry malt extract
- 3 oz. Willamette hops
  (5.1% alpha acid), 1.5 oz. for
  45 min., 1.5 oz. for 2 min.
- 4 tsp. gypsum
- 22-oz. starter Wyeast 1098 (British Ale)
- 3/4 cup corn sugar for priming

### Step by Step:

Bring 2 gal. water to boil. Add 1.5 oz. hops, DME, and Nut Brown Ale kit. Boil 45 min. Treat your water with gypsum (if needed). In the last 2 min. of boil, add 1.5 oz. hops. Cool wort and add to fermenter containing 3.5 gal. pre-boiled, chilled water. Pitch starter and aerate wort.

Ferment in primary 16 days in the low-60° F range and one week in the secondary at the same temperature. Prime with corn sugar and bottle. Bottle condition three weeks.

OG = 1.048FG = 1.014

# **Snow Goose**

# Wild Goose Brewing Co.'s Snow Goose

#### (5 gallons, all-grain)

Snow Goose from the Wild Goose Brewing Co. on Maryland's Eastern Shore is one of my all-time favorites. This annual winter treat always finds me stashing away plenty for summer. However, no more stashing is required as evidenced below! If I owned a brewpub, this would be my house beer.

Steve Lineweaver Delmar, Md.

### Ingredients:

10 lbs. pale ale malt

- 1 lb. crystal malt, 60° Lovibond
- 0.25 lb. chocolate malt
- · 0.25 lb. roasted barley
- 1 lb. malted wheat
- 1.5 oz. Cascade hops (6% alpha acid),
   1 oz. for 60 min., 0.5 oz. for dry hopping
- 1 oz. Fuggle hops (6% alpha acid),
   0.5 oz. for 45 min., 0.5 oz. for 30 min.
- 1 oz. Goldings hops (5% alpha acid), to steep
- Wyeast 1318 (London Ale III)

### Step by Step

Add grains to 4 gal. of water at 168° F for mash temperature of 154° F. Sparge and collect 6 gal. wort. Boil 15 min., then add 1 oz. Cascade. Boil 15 min. more, then add 0.5 oz. Fuggles. Boil 15 min. more, then add another 0.5 oz. Fuggles. Boil for 30 min. more for a total boil of 75 min. Turn off heat and steep 1 oz. Goldings hops for 10- 20 min. Chill, aerate, and pitch yeast.

Ferment in primary at 64°-74° F for four to eight days and rack to secondary for seven to 10 days. Bottle or keg as usual.

# Alex's Wicked Ale Pete's Wicked Ale

# (5 gallons, extract with grains)

I was intrigued by the prospect of replicating commercial beers from the start. Here is a relatively simple recipe that happens to yield a beer very similar to Pete's Wicked Ale.

> Alex McNair Corpus Christi, Texas

#### Ingredients:

- 1 lb. crushed English two-row malt, 64° Lovibond
- 6 lbs. amber extract
- 2 oz. Burton salts
- 2 oz. Northern Brewer hop pellets (8-11% alpha acid), 1 oz. for 60 min., 1 oz. for 30 min.
- 1 oz. Kent Goldings hop pellets (5-6% alpha acid), steeped for 5 min.
- · Muntons ale yeast

#### Step by step:

Heat 2 gal. water to 150° F and steep the malt for 15 min. Remove the grain bag and boil the liquid. Turn off the heat and dissolve the Burton salts. Add the extract and bring to a boil once again. After the break (about 5 min. into boil), add 1 oz. Northern Brewer and boil 30 min. Add 1 oz. Northern Brewer and boil 30 min. more. Total boil is about 60 min. Turn off heat and add the Kent Goldings. Steep covered for 5 min. Transfer to primary and top off with preboiled, chilled water to 5 gal. Add yeast at 75° F.

Ferment for seven days (four in primary and three in secondary). Bottle or keg as usual.

> OG = 1.045FG = 1.018

# Fred's Liberty Pale Ale Anchor Liberty Pale Ale

(5 gallons, extract and grains)

Fred Goeldi Warren, Mich.

# Ingredients:

- 7.5 lbs. Alexander's Pale Malt Extract
- 0.5 lb. crystal malt, 17° Lovibond
- 4 oz. cara-pils malt
- 5.5 oz. Cascade hops (7% alpha acid),
   2 oz. for 60 min., 2 oz. for 5 min., 1.5
   oz. for dry hopping
- · 1 tsp. Irish Moss
- 22-oz. starter of Wyeast 1056 (American Ale)
- 3/4 cup corn sugar for priming

#### Step by Step:

Add crystal and cara-pils malt in grain bag to 2.5 gal. water. Bring to a boil. Remove grain bag and add extract and 2 oz. hops. Boil 45 min. Add Irish moss and boil 10 min. more. Add 2 oz. hops and boil 5 min. more for a total boil of 60 min. Cool wort, topping up to 5 gal. with chilled, pre-boiled water. Aerate well, and pitch starter.

Rack to secondary after fermentation is complete and dry hop with 1.5 oz. hops for two weeks. Bottle with corn sugar and condition three weeks. Alcohol by volume is 5.8%.

OG = 1056-1060 FG = 1008-1012

What do you think? Are these recipes great or can you do better? Send your clone recipes to: Not Just for Sheep c/o BYO, 216 F St., Suite 160, Davis, CA 95616 or e-mail to edit@byo.com.

# Hemebrewing During Prehibition: a Family Affair

Mother's in the kitchen
Washing out the jugs;
Sister's in the pantry
Bottling the suds;
Father's in the cellar
Mixing up the hops;
Johnny's on the front porch
Watching for the cops

Poem by a New York state Rotary Club member during Prohibition

Prohibition accentuated the "home" in homebrewing. Many American families recount and cherish tales of grandpa's inept experimental attempts to brew beer in the kitchen and grandma's gallant efforts to hide the results from Prohibition agents. Although most homebrewers practiced their hobbies with minimal adverse consequences, this homebrewing boom did have a casualty: the reputation of homebrewing.

In an era when intoxicating liquors were illegal, the ingredients to produce them were not. "For so long as the fruits of the orchard, the grain and roots of the field remain, the distiller and home-brewer have an inexhaustible supply of the raw material for producing alcohol. It is a matter of common notoriety that we are becoming a nation of adepts in the making of intoxicants," wrote John Koren, author of Alcohol and Society, in his essay "Inherent Frailties of Prohibition."

# The Hemebrew Market

While Prohibition formally ended the sale of intoxicating beverages from 1920 to 1933, it inspired an explosion in homebrewing. Beer consumption increased gradually during the 1920s,

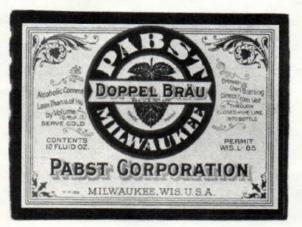
by Amy Jablener



climbing to about 25 percent of its pre-Prohibition rate by 1930. This homebrewing revolution was sustained with the eager assistance of merchants who sold malt extracts for "baking."

"Before Prohibition there was little or no malt extract on the market. Now there is an enormous amount of baking done, according to the amount of extracts being sold," wrote A. W. McDaniel, a Prohibition agent. Eight years after Prohibition began, more than 500 malt and hop shops prospered in New York City. Another 100,000 stores sold malt syrup nationwide, including Atlantic and Pacific (A & P), Kroger, and Piggly-Wiggly grocery stores. Prior to Prohibition only 500 to 600 shops sold malt syrup nationwide. By 1928 25,000 shops, including Woolworth's, were selling homebrewing equipment such as bottle cappers and tubing.

Sales of malt syrup boomed. In 1926 438 million pounds were produced and in 1927 450 million. An estimated 90 percent of this syrup was



18th Amendment.

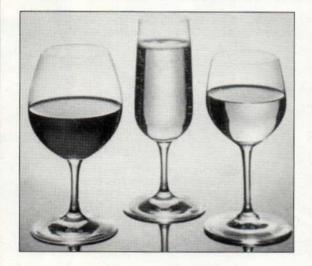
used to brew 6.5 billion pints of beer. Some homebrewers made beer from scratch, while others supplemented the potency of near beer, which was legal, with the help of malt syrups. Even with this use, between 1920 and 1928 production of near beer plummeted from 285 million gallons to about 100 million gallons.

In one year hop sales, excluding sales for near beer and export, exceeded 13 million pounds, the vast majority of which was presumably used to brew beer at home. By 1929 the

Prohibition bureau, using sales figures for hops, malt, and other ingredients. estimated that Americans brewed 700 million gallons of beer at home.

Businesses thrived by selling equipment and other supplies to make liquor. In 1928 a writer for Collier's magazine observed: "It looks very much as if the wet [pro-alcohol consumption] half of the population is busy making wet goods and the dry half is busy selling the ingredients and the machinery." In the mid-1920s sales of homebrewing paraphernalia and

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Eastern U.S.A. L.D. Carlson Co. 463 Portage Blvd., Kent, Ohio 44240 1-800-321-0315 Quebec Distrivin Ltée. 950 Place Trans Canada Longueil, Quebec 14G 2M1 (514) 442-4487 ingredients amounted to roughly \$136 million annually.

### Legal Trade

Business was so good that as their influence and income grew, the malt syrup manufacturers and merchants formed their own national trade associations, the National Association of Malt Syrup Manufacturers (the producers) and the Interstate Food

Products Association (the retailers and wholesalers). These associations promoted their products in trade journals entitled *Sips* and *Malt Age*.

Advertising and selling malt syrups without running afoul of the law was a tremendous challenge. Although not illegal *per se*, the possession and sale of brewing ingredients and equipment could not be advertised to indicate that their intended use was for brewing or

beverage purposes. As a result of this law, the syrup industry had its product designated as food by the patent office and stressed this classification to its members. Some manufacturers followed the advice of the malt syrup manufacturers' association and advertised their syrups with an emphasis on the virtues of the syrup for baking and other food-related uses. Manufacturers also omitted the words "hops" and "hop flavored" from their labels.

Some manufacturers did not always adhere to these recommendations. One advertisement was illustrated with a drunken camel leading four other equally besotted camels in a rendition of Sweet Adeline. In a thinly veiled attempt to keep fellow syrup manufacturers at bay, the advertisement also mentioned food uses for the syrup. Since the syrups were supposed to be used for baking hop-flavored muffins, they were named in such a way as to only intimate their intended use. Gesundheit, Nitecap, Bismarck, Double Dutch, Mixit, and Pilzenbaur malt syrups were all sold to the public.

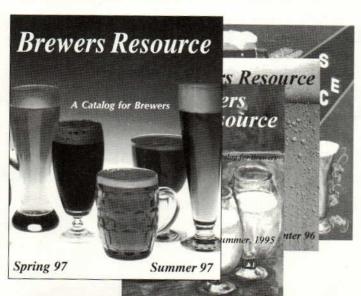
### Busted!

In the first 10 years of Prohibition, federal agents seized one billion gallons of malt liquor. The beer was customarily described as undrinkable, unsanitary, and filthy. Homebrewed beers were characterized as sludgelike with a mud-brown appearance, a sour and yeasty smell, and a taste like



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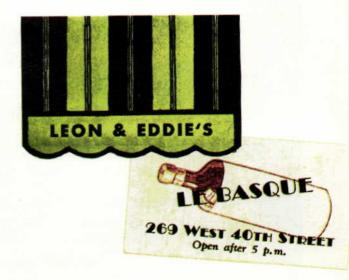
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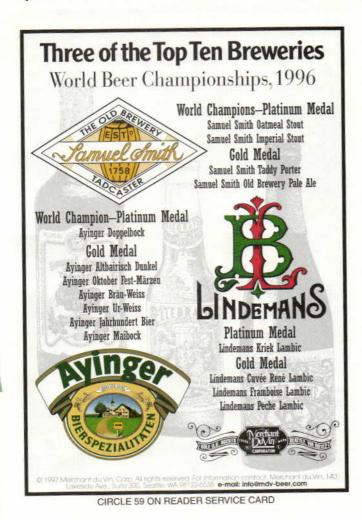
Finding a
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liquor became
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passtime.
Some homemade
liquors were
texic, which
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seem more
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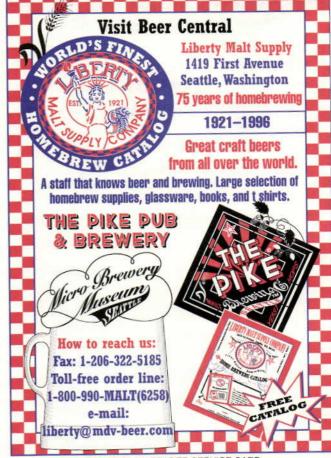


laundry soap. Some noted after effects could be equally disagreeable. Beers were described as "explosive" with a tendency to cause severe headaches and an inability to focus one's eyes.

Hugh F. Fox, secretary of the US Brewers Association and a leading spokesman for the wets and the brewing industry, called homebrewed beer "troublesome and messy, and not very successful" and added that one could not produce "a light, palatable, and wholesome brew without the use of highly specialized and costly apparatus and facilities for sterilizing, filtering, and refrigeration." He went on to describe the ales as a "poor imitation of old-fashioned stock ales, which contain at least twice as much alcohol as the lager beer of commerce."

Although not always refreshing, homebrews were not nearly as dangerous as other alcoholic beverages concocted during the era. Drinking





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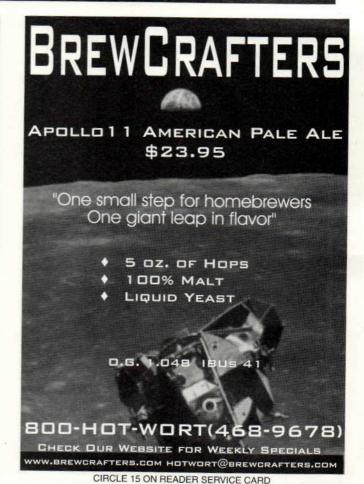


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some homemade liquors had dreadful consequences including paralysis and death. Tens of thousands of people died from alcohol poisoning from beverages made from denatured alcohol intended for industrial use. This "liquor" contained traces of poisons such as sulfuric and hydrochloric acids and wood alcohol. According to the US Public Health Service, 11,700 people died from imbibing poisonous liquors in 1927. Embalming fluid, antifreeze, and rubbing alcohol were also used to make homemade liquors.

George S. Hobart, a former member of the New Jersey assembly, in arguing that beer sales should be limited to near beer, wrote: "I am told that a recent test has been discovered in Washington which can be used only when the moon is at the full. It is said that if a man sees only one moon he has been drinking less than one half of one percent [beer]; if he sees two moons he has been drinking more than one half of one percent; and if he sees no moon at all, he has been drinking wood alcohol!"

Under the National Prohibition Act, "any room, house, building, boat, vehicle, structure, or place where intoxicating liquor is manufactured, sold, kept or bartered...is declared to be a common nuisance." The misdemeanor of homebrewing could result in a fine of up to \$1,000 and/or imprisonment of up to one year. This law was rarely enforced because homebrewers mostly operated within the privacy of their homes, and it was difficult to invade private homes.

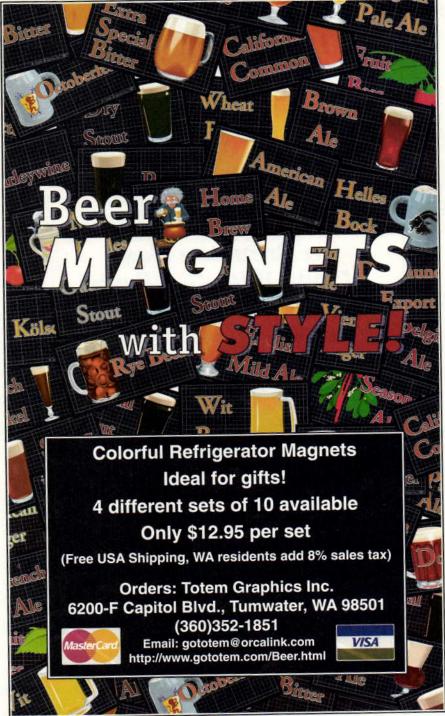
Law enforcement encountered a legal quandry in the attempted enforcement of anti-homebrewing laws and as a result did not often enforce them on private individuals. To search a private dwelling agents needed a search warrant. However, warrants could only be issued if there was evidence a residence was being used for the sale of liquor, not just production for home use.

A writer in the late 1920s noted that if a dry had his way and a home-brewer's home was not respected as being private in the courts, "America would become almost at a stroke the world's greatest homeless country, and instead the land of

breweries, wineries, and distilleries."

When homebrewers were brought into court, it often resulted in mild or no sanctions. A Nebraska attorney, Frank Bartos, was nearly disbarred as a result of his homebrewing. Agents caught Bartos with 700 quarts of homebrewed beer. Even though Bartos violated the law, an appeals court





found that "the act was in private social life, and not professional character." Homebrewing was deemed not to be an act of "moral turpitude" but rather a private act that did not reflect on Bartos' fitness to practice law. One judge wrote, "The offense of Bartos was possibly the mildest that could be committed under the National Prohibition Act, were it not for the large quantity of beer so made."

Parenthetically, he went on to comment that "700 quarts of beer would indicate considerable capacity on the part of his family, or numerous guests with large capacities."

### A Beer By Any Other Name ...

Since Prohibition outlawed the manufacture, sale, and transportation of intoxicating beverages including beer, the definition of how much alcohol is necessary to make a drink intoxicating and what constitutes "beer" was a matter of constant debate. Common defenses to homebrewing included the claim that homebrew was not an "intoxicating beverage" under the National Prohibition Act and that "homebrew" is not by definition the same as "beer." Although "beer" was recognized under the law as being illegal, "homebrew" was not.

In arguing for the legalization of a real beer containing 3 percent alcohol, Sen. Walter E. Edge of New Jersey wrote that the word beer suggests "the old days of reeking barrooms and saloons." He facetiously suggested that if the three percent beverage were called "sunshine" or "golden dew," no one would complain about its production. Senator Edge reasoned "that it is the word 'beer' which is antagonized rather the contents or the effects thereof."

Prohibition agents were not particularly distressed by homebrewing when other more potent and portable liquors were available. In publicizing a \$25,000 prize for the best plan for repealing the 18th amendment, which stresses temperance rather than outright prohibition, publisher William Randolph Hearst wrote that it is "easier for the law-defying element to deal illicitly in hard liquors than in the milder and bulkier form of alcoholic drinkables." This was especially true because under Prohibition "a man who wants a mild drink is compelled to take a strong one; and a man who wants a good drink is compelled to take a bad one."

The homebrewing boom was not sustained after Prohibition. The often muddy, unpalatable, and amateurish beers of the homebrewer lost favor to the pale, lightly hopped beers of the professional brewers. Brewers geared up for production as soon as Prohibition ended, and homebrewing did not become legal until 1979. Shortly after midnight on the day Prohibition officially ended, a brewer from St. Louis delivered two cases of beer to the White House with the salutation, "Here's to you — President Roosevelt."



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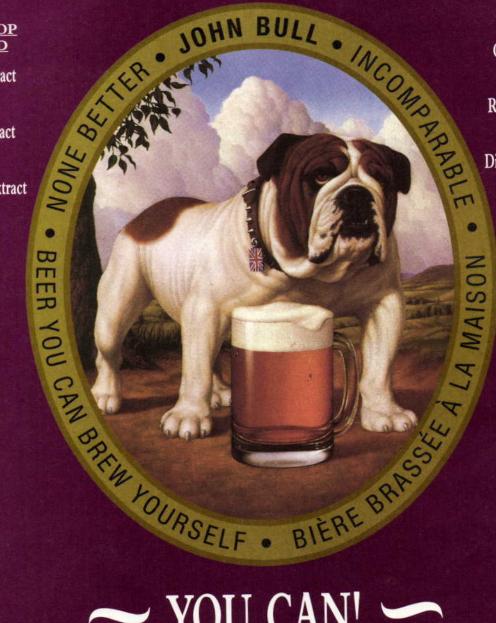
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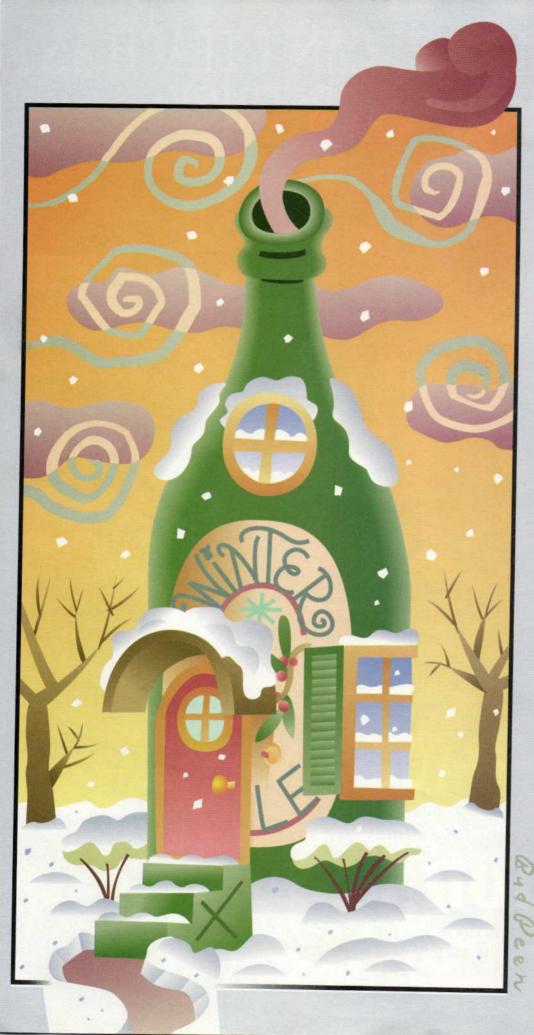
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# Hom

Whether you celebrate Christmas, Hanukkah, Winter Solstice, or some other variation of the mid-winter holidays, you are sure to find a common thread that is near and dear to the homebrewing heart: celebratory beverages. Winter holidays, winter time in general, in cold weather especially. are cheered up considerably by a special strong brew designed for the season. Imagine the Christmas party at Old Fezziwig's without a steaming bowl of punch. Or a Norse mid-winter's eve gathering without mead. Wassailing from door to door, blessing the apple trees with last year's cider, toasting the New Year with Champagne, even our mild American tradition of eggnog with rum. These are all versions of the same idea, the same primal need.

Special brews are a key ingredient in sociability. We gather with friends and family at this time of the year. We celebrate the seasons with food and drink, commemorate the

### ebrew Holidays by Scott R. Russell

passing of time with memorable elixirs. But also, we *need* the stronger, richer flavors and full-bodied sustenance that holiday brews provide. It gets cold (in most places) at this time of the year! I know I can't face the thought of going out for more wood or to walk the dog without a bit of "antifreeze" either already in or waiting for my return.

Beer, especially, has taken on for me the role of winter solace. I plan ahead, starting in late spring to put up a stock of fortifying brews to get me through the winter — which in Vermont means about six months. (In fact on the last day of the summer this year, we surveyed the damage from the first sub-30° F night and the first frost of the season!)

There's quite a variety of suitable brews. Old ales, barley wines, strong stouts, bocks, wee heavies, strong Belgian ales, and so forth are all appropriate companions next to the fire. But

strong isn't the only characteristic or the only possibility. Rich and flavorful are just as important, which is why many winter brews are spiced, fruit-flavored, or highly hopped. Strong bitters, lambics, IPAs, festbiers and other winter lagers, holiday beers spiced with everything from pie spices to spruce and licorice, someone has brewed it with the season in mind.

The homebrewer has an advantage over the big commercial brewer, because we can brew a little or a lot, experiment on a small scale, and try things that would be economically unwise on a bigger scale. The recipe that became Pete's Wicked Winter Ale, after all, was the winner of a homebrew competition. Would Pete have tried it on a large scale first? I doubt it.

Here are ideas for ideal brews for the winter season. All are a bit stronger than average, rich and full of flavor, and yet easy to brew.



(5 gallons, extract and specialty grains)

No, this brew won't give you second sight or cause hallucinations, but it might make you take another look at Belgian ales. Be careful; this is a huge beer.

#### Ingredients

- 1 lb. Belgian Special B malt
- 1 lb. toasted pale malt (preferably Belgian)
- ½ lb. dark crystal malt (120° Lovibond)
- 1/2 lb. wheat malt
- · 2 oz. black patent malt
- 10 lbs. amber malt extract syrup

- 1 lb. amber candi sugar
- 1.5 oz. Northern Brewer hop pellets (8-11% alpha acid), for 90 min.
- 1 oz. Fuggle hop pellets (4% alpha acid), for 30 min.
- 1/4 oz. cracked cardamom
- 1/4 oz. cracked coriander
- 1 qt. Belgian Ale yeast slurry (preferably a strain tolerant to high gravity) or 20 g. dry ale yeast and 5 g.
   Champagne yeast
- 2/3 cup corn sugar for priming

#### Step by Step

Steep grains in 3 gal. cold water. Raise heat gradually (over the course of 30 min. or so) to 170° F, remove grains, and rinse them back into the kettle.

Add malt syrup and candi sugar to the kettle. Bring to a boil. Add Northern Brewer hops, boil 60 min. Add Fuggle hops, boil 30 min. more. Remove from the heat. Total boil is 90 min. Add spices and steep for at least 30 min. before cooling. Top off with pre-boiled, chilled water to get 5.25 gal. At 70° F pitch yeast.

Ferment at 68° to 70° F for three weeks, rack, and condition at 65° F for three to four more weeks. If necessary (if final gravity is still above 1.025), pitch fresh champagne yeast and rerack to a third vessel. Age another two weeks. Prime with corn sugar, bottle, and age well (six months, minimum). This is a keeper. Put some aside for next year.



### Wee Winter Warmer

(5 gallons, partial mash)

A brew that will keep you from feeling the wind off the Loch as the cold breeze blows up your kilt...

### Ingredients

- · 4 lbs. British pale malt
- 2 lbs. medium to dark crystal malt (90° Lovibond or darker)
- · 4 oz. roasted barley

- 6 lbs. amber unhopped dry malt extract
- · 2 cups dark brown sugar
- 2 oz. Challenger or Target hop pellets
   (7 % alpha acid), 1 oz. for 120 min.,
   1 oz. for 45 min.
- 1/16 oz. each fresh cumin seed, grains of paradise, and thyme
- 10 to 14 g. dry ale yeast
- 2/3 cup dry malt extract for priming

#### Step by Step

Heat 2 gal. water to 168° F, then mix in crushed grains. Mash should settle around 156° F. Hold 75 min. Runoff and sparge with 2 gal. of water at 168° F.

To the kettle add amber dry malt extract and brown sugar. Bring to a boil, add 1 oz. hops. Boil 75 min., add remaining hops, and boil another 45 min. Remove from heat. Total boil is 120 min. Add spices and steep for 30 min. before cooling. Top off in the fermenter with pre-boiled, chilled water to reach 5.25 gal. At 68° to 70° F, pitch yeast.

Ferment cool (60° to 65° F) for two weeks, rack, and condition for four weeks at 50° F. Prime with dry malt extract, bottle, and age until the season is right.



(5 gallons, partial mash)

This beer combines the best of dunkelweizens and festbiers. The ultimate après-ski tipple.

#### Ingredients

- · 2 lbs. lager malt
- · 2 lbs. malted wheat
- 1 lb. medium crystal malt (60° Lovibond)
- · 2 oz. chocolate malt
- 3 lbs. unhopped wheat dry malt extract
- 3 lbs. unhopped light dry malt extract
- 0.8 oz. Tettnanger hop pellets (5%

- alpha acid), for 60 min.
- 1.25 oz. Spalt hop pellets (3% alpha acid), for 45 min.
- 1/2 oz. fresh whole Hallertauer hop flowers or plugs (3.5% alpha acid), at end of boil
- 10 to 14 g. dry lager yeast or a liquid slurry (such as Wyeast 2308 Munich)
- 7/8 cup corn sugar for priming

#### Step by Step

Heat 2 gal. water to 162° F. Mix in crushed grain. Mash should settle around 151° F. Hold for 90 min. Run off and sparge with 3 gal. water at 169° F.

Add the dry malt extract to the kettle. Bring to a boil and add Tettnanger hops. Boil 15 min., add Spalt hops. Boil 45 min., remove from heat, and add Hallertauer hops. Total boil time is 60 min. Steep 10 min., remove hops, and cool. Top off in the fermenter with preboiled, chilled water to get 5.25 gal. Aerate well and at 65° F pitch yeast.

Ferment cool (50° to 55° F) for two weeks, rack, and lager cold (40° F) for eight to 10 weeks. Prime with corn sugar, bottle, and age cold for at least eight more weeks.



(5 gallons, extract and specialty grain)

It may seem tacky, but there is something very festive, seasonal, even nostalgic about the scent of an evergreen tree. If this aroma is not overdone (which happens too easily and often) it's really great in this strong, dark lager. This beer is especially good to brew in the early spring, when the spruce trees are just beginning to sprout new needles.

#### Ingredients

- 1 lb. medium crystal malt (40° to 60° Lovibond)
- 4 oz. chocolate malt
- · 8 oz. wheat malt
- · 4 oz. toasted lager malt

- · 6 lbs. unhopped amber dry malt extract
- · 2 lbs. unhopped dark dry malt extract
- 1.5 oz. Hallertauer hop pellets (3.5% alpha acid), for 75 min.
- 1 oz. Spalt hop pellets (3% alpha acid), for 15 min.
- · 1 cup loosely packed fresh growth from a spruce tree
- 10 to 14 g. dry lager yeast or a liquid yeast slurry (Wyeast 2278 Czech Pils is good for big bocks like this one)
- 3/4 cup corn sugar for priming

### Step by Step

Steep grains in 3 gal. of cold water. Raise heat gradually to near 170° F, remove grains, and rinse them with hot water back into the kettle.

Add the dry malt extract to the kettle. Bring to a boil, add Hallertauer hops. Boil 60 min. Add Spalt hops and spruce needles (in mesh bags), boil 15 min. more. Total boil time is 75 min. Remove from heat, set kettle in the sink, and remove hops and spruce needles. Chill wort and add to fermenter. Top off with pre-boiled, chilled water to make 5.25 gal. At 65° F or so, pitch yeast.

Ferment cool (60° F) for two weeks, rack, and lager at 38° to 40° F for six to eight weeks. Prime with corn sugar and bottle. Age four to six months.

### **Baltic Imperial Stout**

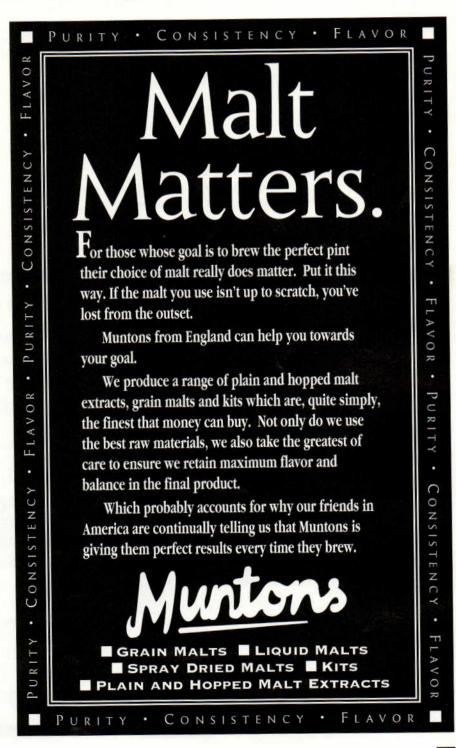
(5 gallons, partial mash)

Although not always a winter brew, imperial stout can't help but fit the mood of the cold weather. After all, does it ever warm up in the countries that used to be part of the empire? This is the Baltic version (as in Estonian, Latvian, Lithuanian), which is richer and stronger than the Russian version. I'd bet that this difference is connected to the reasons those countries are once again out of the empire...

### Ingredients

- · 3 lbs. British two-row pale malt
- 1 lb. dark crystal malt, 90°-120° Lovibond
- 1/4 lb. black patent malt
- 1/2 lb. roasted unmalted barley
- 1/4 lb. malted wheat
- · 1 lb. flaked oats
- · 7 lbs. unhopped dark malt syrup
- 1 cup unsulphured molasses
- 1/2 lb. brewer's corn sugar

- 1 cup chopped sultanas or dried red currants (optional)
- · 2 oz. Brewer's Gold hop pellets (8% alpha acid), for 90 min.
- 1.5 oz. Styrian Golding hop pellets (4% alpha acid), for 45 min.
- 1 oz. Fuggle hop pellets (4% alpha acid), for 30 min.
- · British ale yeast (such as Wyeast 1318, London Ale III)
- 5-7 g. dry wine yeast



· 1 cup dark dry malt extract for priming

#### Step by Step

In 2 gal. of water heated to 167° F. mash in cracked malts, roasted barley. and oats. Mash should settle to 156° F or thereabouts. Hold for 75 minutes, then begin runoff. Sparge with 2.5 gal. at 168° F, collecting approximately 3.5 gal. of sweet runoff.

Add malt extract syrup, molasses, and sugar. Bring to a boil and add the Brewer's Gold pellets. Boil 45 min., then add Styrians. Boil 15 min., then add the sultanas and the Fuggles. Boil 30 min. more. Total boil is 90 min.

Chill, top off to 5.25 gallons with pre-boiled, chilled water. At 70° F or so, pitch yeast slurry. Ferment in a coolish corner (60°-65° F) for two weeks, rack to secondary, and add the wine yeast. Condition in the dark at 55° F for six weeks. Prime with malt extract and bottle, then age in the dark at 50°-55° F for six more weeks.



### Biere de Garde aux Cerises

(5 gallons, extract and grain)

Bieres de garde are strong Northern French lagers (this one is a cherry lager), brewed to be put up and stored for a long time. Kind of like a bock but with more of a balanced flavor; less emphasis on the malt and malt alone. As with Unibroue's Quelque Chose, you might even consider warming it up to take the chill out of your bones.

#### Ingredients

- 1 lb. cara-Vienne malt
- 1/2 lb. cara-pils malt
- 1/2 lb. Munich malt
- 8 lbs. light unhopped dry malt

#### extract

- · 1 oz. Spalt (Strisselspalt if you can get it!) hop pellets (3% alpha acid), for 60 min.
- · 2 oz. Tettnanger hop pellets (5% alpha acid); 1 oz. for 40 min., 1 oz. for 30 min.
- Neutral liquid lager yeast (I like Wyeast 2042, Danish Lager)
- 8 oz. concentrated black cherry juice (substitues: 20 oz. fresh normalstrength juice or 5 lbs. fresh whole black cherries)
- 3/4 cup corn sugar for priming

#### Step by Step

Steep grains in 2.5 gallons of water about 150° F for 30 min. Remove grains, add dry malt extract, and bring to a boil. Add Spalt pellets at the onset of boil. Boil for 20 min., then add 1 oz. of Tettnanger. Boil an additional 10 min. and add the remaining Tettnanger. Boil 30 min. more. Total boil is 60 min.

Chill, top off to 5.25 gallons with pre-boiled, chilled water. At 65° F. pitch yeast. Ferment cool (50° F) for

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three weeks, rack to secondary, and add cherry juice. Condition relatively warm (60° F) for a week, then cool to 50° F for three to four weeks. Prime with corn sugar, bottle, and age for eight to 10 weeks.

Alternatives: If using fresh cherries, freeze them, thaw them, and mash them slightly, then place them in the secondary and rack the beer onto them. You will then need to re-rack to a third fermenter after two weeks or so, leaving behind the cherries, of course, and condition cool as above.



Candi sugar: Two major whole-

salers are now carrying candi sugar as a regular product, so more and more homebrew retailers are able to get it for you. Candi sugar comes in light, amber, and dark and is merely crystallized refined beet sugar.

Toasted malt: Try toasting your own. Take the required amount of whole grain and spread it thinly on a cookie sheet. Place in a preheated oven (350° F) for 10 to 30 min., depending on how dark you want it.

Spices: These recipes call for fairly common spices with the exception of grains of paradise. If you can't find these, you can get away with a combination of equal amounts of black pepper and cardamom, not to exceed the suggested amount of grains of paradise.

Yeast: Especially with lager strains, the viability and purity of the yeast in a liquid yeast strain will usually be far superior to a dry strain.

Specialty grains: Many brewers

like to use appropriate grains when brewing, for instance British grains in British style beers and German in lagers.

The dubbel recipe calls for Special B, which is a dark, Belgian, crystal-like malt. It gives darker Belgian ales a rich, sweet, toffee-ish flavor profile. It's great dry by the handful, too.

Temperature: Remember that higher mash temperatures (154° to 158° F), thicker mashes (0.75 to 1.2 qt. per pound of grain), and shorter saccharification rests (60 to 75 minutes) all contribute to a more full-bodied beer.

Recommended fermentation temperatures for all of these recipes are on the cool side, as suits the recommended yeasts.

Higher fermentation and condition temperatures will most likely cause too fast a fermentation, resulting in off-flavors. These recipes all require a good, clean fermentation to show off their complexity.

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# Creative Kegging

Just about the coolest technology available to every amateur brewer is the soda canister, better known as the Cornelius keg. The quality, versatility, availability, and cost of Corny keg equipment makes it perfect for homebrewing applications. Here are some tips for getting the most from your equipment — and from the kegging experience.

I

Keep Kegs Clean

Corny kegs are simple to clean because the interior is easily accessible. Commercial Sankey beer kegs, while having a higher capacity than Corny kegs, are far more

by Kirk R. Fleming

difficult for the amateur brewer to charge, dispense, and clean. Corny parts are plentiful and readily available from hundreds of sources, even though they can be a bit pricey. In any case only a few key points need to be kept in mind for proper care.

Complete keg disassembly isn't really required after every use if you're dispensing beer that has been well separated from the yeast and your dispense keg is kept in constant use.

Take all the fittings completely off the keg and remove all seals for a thorough washing prior to storage. Using hot, soapy water and a toothbrush, make sure all the parts are free of any residue, especially on the poppet valves. Avoid using any abrasives on the stainless steel parts. Definitely do not use steel wool pads, which leave behind corrodible iron particles. Non-abrasive 3M Scotch pads or a sponge work best.

Occasionally, it's also a good idea to clean out the inside of the gas and beverage tubes. This can be done by pushing a small cotton patch through the tubes using a wooden dowel or by pulling a patch through the tubes by tying a patch to a length of fishing line. Look through the tubes to ensure the inside surface appears uniformly smooth and shiny.

### H

### Avoid Mold that Likes Cold

If you use a refrigerator or freezer chest dedicated to keg storage, you've probably noticed the problem of mold. Any spilled or leaked beer left inside the refrigerator soon develops a growth of mold. An occasional cleaning with Lysol, Dow, or other foaming bathroom cleanser is easy on the plastic surfaces and also retards mold growth.



Ferment in Your Keg

Chances are you were brewing for quite some time before you invested in Corny keg equipment for homebrewed draft beer. If that's the case, you may already have a number of fermenters, including glass carboys and plastic buckets. Still, Corny kegs are great for secondary fermentation vessels. They are compact, they stack well, and they don't break.

Although some brewers use Corny kegs for primary fermentation, most brewers reserve them for use only for the cleaner, less volatile secondary stage. This keeps the kegs cleaner and eliminates any need to deal with blow-off problems. Situate the kegs almost horizontal, with the top of the



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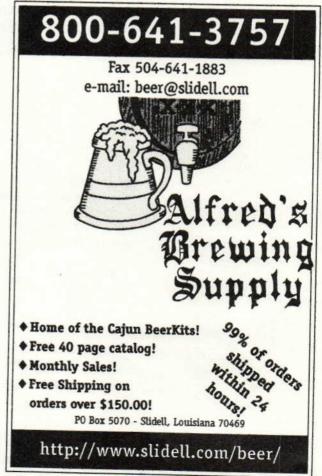
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keg held about six inches higher than the bottom and with the gas-in valve as high as possible. Connect a short length of tubing to a quick-disconnect gas fitting, and connect the fitting to the keg's gas-in valve. Place the open end of the tubing into a container of water to act as an airlock.

If you really want to do your primary fermentation in soda canisters, you should allow plenty of blow-off capacity. Allowing a primary fermentation to vent through a poppet valve could lead to a plugged vent and extremely high fermenter pressures. Some brewers have modified the keg lid to accommodate this, which is a good idea.

You can get a spare lid to modify from your mail-order or local supplier. With the lid clamped to a bench to avoid disaster, drill a hole through the lid midway between the relief valve and the edge. You can use a variety of fittings from the home improvement store to provide a sealed vent suitable for a large-diameter blow-off hose. There are many options available in large stores. You'll be able to devise a system that works best for you, one that can be capped off when you want to use the lid normally.

One note: You may want to avoid dry hopping. Hops tend to plug the poppet valves.

### IV

Use Your Keg's Downtime

It's often nice to be able to tap a glass of plain soda water for a real refreshing drink. After cleaning out a keg, fill it with three to four gallons of cold tap water (or even your favorite bottled water), then seal and pressurize to 35 psi and refrigerate. With a squeeze of lemon or lime, you've got a delightfully dry, sugar-free thirst quencher. Try extracts such as orange, raspberry, strawberry, and cherry, as well. Vodka sodas are an obvious option if you like that sort of thing.

### V

### Use Real Faucets

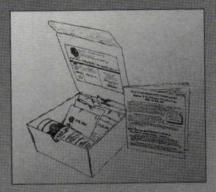
You can buy real beer faucets like those you see in bar-top mounts at

your favorite establishments and install them at home on your keg refrigerator. If you don't mind blasting a few holes through your refrigerator door (or side panel), this is a fairly easy thing to do and adds real charm to your draft dispense.

A one-half-inch drill bit can be used to get things started if you don't have larger equipment. Then the hole can be neatly enlarged for the faucet

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stem using a small hand grinder, such as the Dremel hobby grinder.

For each faucet you'd like to install, you'll need a faucet (of course) with mounting flange, a beer stem and nut, a barbed flange, nut, and washer. These parts are available at many homebrew supply shops.

If you buy locally, don't leave the store without ensuring you have all the required seals (basically one for each end of the threaded stem that passes through the refrigerator wall).

On the inside of the refrigerator, the hose that will carry beer from your keg to the faucet can be terminated on one end with a swivel nut and threaded onto a quick-disconnect fitting. The quick disconnect makes it convenient to disconnect the keg completely from the dispense gear to prevent leaks.

### VI

Change Your O-Rings

Original equipment Corny kegs were intended to be kept at fairly high pressure compared to what is needed for beer. You may have noticed that at five to 10 psi (barely enough pressure to dispense), keg lids leak gas. Fatter, softer o-rings are available that provide a better seal and don't depend on keg pressure to keep lids gas tight. Check out the selection at your local retailer or hardware store or available through mail order catalogs.

To stop leaks quickly, momentarily increase the pressure in the keg. Then decrease the pressure slowly.

### VII

### Protect Your Seals

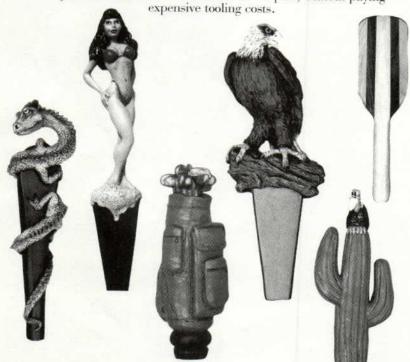
If your keg was used for soda syrup at one time, replace the seals before you use the keg to prevent the transfer of soda flavors to your brew. After you replace them, maintain them.

As quick-disconnect fittings are attached and removed from the keg poppet valve, the fittings slide over the oversized o-ring on the outside of the valve assembly. Without any lubrication, o-rings can get torn and wear out early. Since petroleum-based lubricants attack most rubber materials, non-petroleum lubricants are needed. One popular solution is Keg-Lube.

Available through most dealers who handle beverage equipment, Keg-Lube looks and feels like a lightweight grease but is safe for food contact surfaces and o-rings. A thin film of Keg-Lube applied to o-rings makes it much easier to attach and remove quick-disconnect fittings without harming seals.

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### A Peek into the World of the Single Celled

by Nico Freccia

Fermentation is everything to beer. Without it we'd have sweet barley tea to share with friends or something to put on our pancakes. Fermentation is where the alcohol and CO<sub>2</sub> that make beer are produced, but it is also where the chemical reactions occur that produce all the other subtle flavors and aromas that give beer its complexity. And it is where many off-flavors are created that ruin beer.



Fermentation actually consists of three distinct but often overlapping stages: the initial stage, yeast cellgrowth stage, and fermentation. The initial stage is often referred to as the lag phase, though the lag phase also overlaps the cell-growth stage. The lag phase technically describes the time immediately after pitching when the yeast adapts to the new conditions of its environment and no activity is seen. The lag phase is the period during which the wort is most susceptible to contamination and spoilage by bacteria. Minimizing lag time, therefore, is of the utmost importance to a clean, healthy fermentation.

The initial stage begins when yeast is pitched into the wort. Because the yeast now finds itself in a new environment, it must adjust and prepare itself for the work of fermentation. The initial stage is characterized first by yeast cell wall preparation and then uptake of oxygen, nitrogen, and sugar.

Cell wall preparation consists of the secretion of enzymes needed to make the cells permeable to the sugars and other compounds that will eventually feed it. The cells need an initial store of energy in the form of glycogen and adequate dissolved oxygen to ensure the permeability of the cell walls. If the pitching yeast has been starved, therefore, the glycogen reserves will have been depleted and a long lag time will ensue. With healthy yeast cells and proper pitching rates, temperature, and aeration, the initial stage should be very short, often just a few hours. When the cell walls have been prepared, nitrogen and sugars can be transported into the cell and rapid growth begins.

This stage of yeast cell growth is

often mistakenly referred to as "respiration." Respiration (cell growth in the presence of air, or aerobic, which yields CO2 and water) and fermentation (cell growth in the absence of air, or anaerobic, which yields CO2 and ethanol) are the two ways in which yeast cells can use sugars to produce energy. However, a law called the Crabtree Effect dictates that respiration does not occur with brewing yeast in wort that has a glucose content of greater than 0.4 percent w/v (weight/volume). Since all wort will have a greater glucose concentration than 0.4 percent, respiration cannot occur in brewing. Instead, yeast cell growth in the presence of air is a highly complex stage wherein yeast use up all of the oxygen in the wort for energy buildup and reproduction. Though the yeast is technically fermenting and giving off small amounts of CO2 and ethanol, the majority of its efforts in the presence of oxygen produce not ethanol but sterols and fatty

acids that help build cell walls.

Yeast cells multiply
by "budding," which is a
form of cell division, and
they require strong cell walls
to facilitate budding. This
stage also marks the beginning
of the acidification of the wort.
Rapid yeast growth combined with
acidification will begin to inhibit
any possible bacterial contamination.

During the cell growth phase wort sugars are brought into the cell and broken down into glucose. Glucose in turn is broken down into pyruvic acid. Thus begins a series of enzymatic reactions that yields metabolic energy and CO<sub>2</sub>, and begins the formation of a number of important and

important and largely unwelcome byproducts such as diacetyl (buttery) and fusel alcohols (medicinal). The production of these by-products is greatly affected by temperature. The lower the temperature, the fewer by-products will be produced. Therefore, with a healthy yeast culture and a rapid initial stage, it is crucial that the temperature during cell growth be maintained at the optimum for yeast performance. With most strains this is 65° to 70° F for ale yeasts and 48° to 54° F for lager yeasts.

Fermentation begins when yeast has used up all of the oxygen in the wort. It is very important, therefore, never to introduce any air into the wort once fermentation has begun.

Fermentation makes use

of a bio-chemical
pathway called
the E-M-P
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pathway. The
pathway begins
with pyruvic

acid (the same pyruvic acid created by the breakdown of

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glucose during the cell-growth phase) that is broken down into acetaldehyde and then to ethanol (alcohol). This process generates CO2.

The breakdown of glucose into pyruvic acid and then the route of the E-M-P pathway is the most common pathway that fermentation will take under normal conditions. However, there are branches at the individual steps of the pathway that lead to other, minor pathways that the yeast may use. These minor pathways give rise to fermentation by-products such as diacetyl, esters, fatty acids, and fusel alcohols. Likewise, bacteria will make use of wort materials using entirely different pathways that lead to the formation of the compounds that cause beer spoilage. Fermentation ends when the vast majority of sugars are used up and the yeast begins to settle (flocculate) at the bottom of the fermenter.

### Keeping By-Products in Check

The formation and reduction of unwanted by-products in beer is directly related to the sound fermentation preparation techniques of pitching rate, aeration, and temperature control.

Diacetyl is characterized by a buttery or butterscotch flavor and aroma and is desirable in small amounts in certain styles of beer, notably Englishstyle ales. It is unacceptable in any amount in lagers. Diacetyl has a very low flavor threshold — that is it can be detected in very small amounts (as low as 0.1 part per million).

Compounds created from pyruvic acid and acetaldehyde during fermentation pass through the yeast cell wall and combine with oxygen to create diacetyl. Diacetyl production generally occurs during the cell-growth stage, therefore, and because there is oxygen available, its production cannot easily be avoided. However, all yeasts have enzymes that can reduce diacetyl to harmless compounds. These enzymes work anaerobically during fermentation. Therefore, given the proper amount of time at the right temperature and barring any new introduction of oxygen, yeast will clean up most of the diacetyl in the beer.

Also, diacetyl formation is inhibited by lower temperatures during the

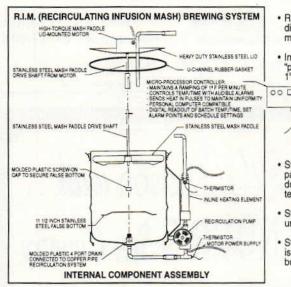
cell-growth phase. This is another reason to keep the temperature at the lower end of the working range at the beginning of fermentation. Some lager brewers begin their fermentations at the low temperature and then raise the temperature toward the end of fermentation to allow the yeast to uptake any diacetyl. This is called a diacetyl rest. Ale brewers often hold their beer at fermentation temperature for at least

24 hours after fermentation is complete to ensure the same diacetyl reduction.

The formation of fusel alcohols, fatty acids, and esters are all encouraged by high fermentation temperatures. Esters are compounds formed from an acid and an alcohol, and have strong fruity aromas. Some esters are appropriate to give complexity to most ales, particularly strong ales. But excessive ester formation can give

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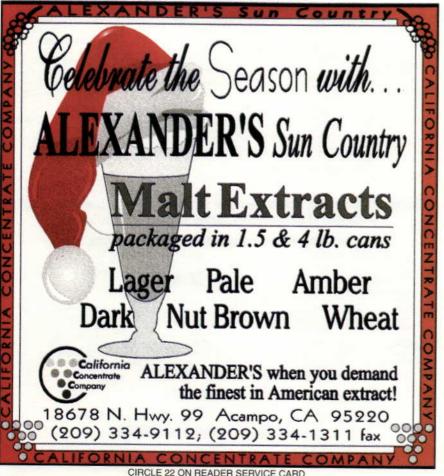
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unpleasant aromas such as banana or pineapple.

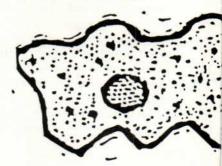
Esters are formed from fatty acids that are used during the cell-growth stage, in the presence of oxygen, to help build up cell walls. If the wort is not aerated properly, fatty acids will not be used to build cell walls but instead will become attached to fusel alcohols to form esters. High-gravity beers hold less oxygen than regular-gravity beers, so ester formation is generally much higher and to some extent expected.

To keep esters, fusel alcohols, and fatty acids down, worts must be aerated thoroughly, especially highgravity worts, and temperature must be kept low.

### **Preparation: Pitching Rate**

Proper preparation of yeast and wort for fermentation offers the greatest amount of fermentation control. Finding a good yeast strain that is appropriate for the style of beer you will be making and is clean, fresh, and healthy is the first step. The most important step in yeast preparation is making certain your pitching rate (amount of yeast you are adding) is high enough. High pitching rates will solve many problems of fermentation and are the single easiest way to improve fermentation.

In commercial breweries there is a standard rule that yeast should be pitched at the rate of one million cells per milliliter of wort per degree Plato (four to 4.5 specific gravity points). This is an amount that is difficult for homebrewers to achieve without culturing up large amounts of slurry. A smaller homebrewing rate is therefore generally agreed upon. There are three main sources of yeast for homebrewers: dry yeast, pure culture yeast (liquid smack pack or slant), and previous batch slurry or slurry from a local brewpub or microbrewery.



Dry yeast contains a high number of cells per gram and so under perfect conditions would provide an ideal pitching rate. However, cell viability (number of live cells) can be very low in dried yeast due to drying, packaging, and storage conditions. Also, dry yeast are more susceptible to being contaminated with bacteria or wild yeast. Dry yeast should be pitched at the rate of 0.5 grams per liter, or about 10 grams for a five-gallon batch of normal-gravity wort. If you are concerned about the yeast's viability, pitch more.

Dry yeast should be properly hydrated before pitching. Hydrating dry yeast is basically the same as proofing yeast for baking. Mix the yeast into a pint of 90° to 110° F water and let it stand for 15 minutes. Cool the slurry to pitching temperature, and pitch. Pay close attention to good sanitary techniques using sanitized bowl, water, mixing spoon, and so forth.

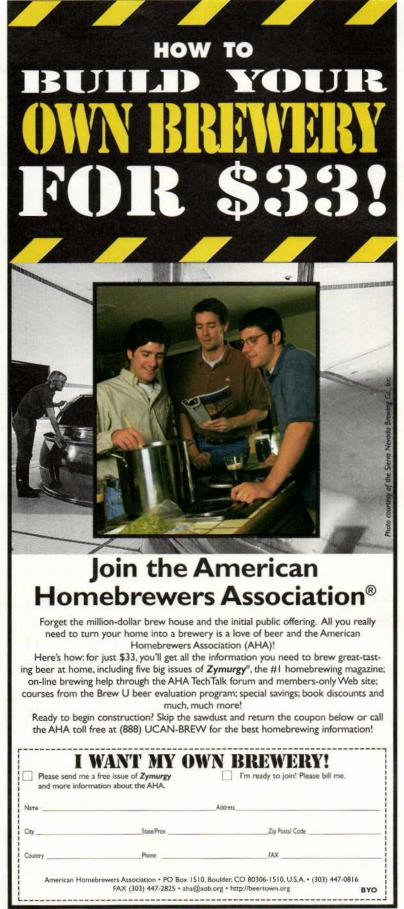
Pure culture yeast is widely available in the form of smack packs. If you maintain a yeast bank or prefer to buy yeast slants, they will also be pure cultures and will be pitched at the same rate as smack packs. Smack packs that have been activated and have bulged to their capacity should contain about 2.5 billion cells. This is about 100 times less than the million-cell-per-milliliter-per-degree-Plato formula. Therefore, just the contents of a smack pack do not provide enough cells for a quick, strong fermentation.

For ales, smack packs and slant yeast should be grown into at least a one-pint starter, although a one-quart starter would be better. Lager yeasts should be grown into at least a one-quart starter and into two quarts if possible. For homebrewing purposes these rates, though still about 10 times lower than the commercial pitching rate, will give excellent results.

With the proliferation of brewpubs today, many homebrewers may pop into their local brewery and ask the

Alternatively, if you brew often enough, you can re-pitch yeast collected from the primary or preferably secondary fermen-

 tations. These slurries will generally be healthy and viable and provide the



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ideal commercial pitching rate.

If you are re-pitching from your own fermentations, you can collect the yeast from the bottom of the fermenter and store it in a sanitized jar for a week or 10 days without losing much viability. Any longer than that and the risk of yeast autolysis (cell death and self-consumption) and loss of viability are too great and the yeast should be discarded. Liquid slurries should be pitched at the rate of one fluid ounce per gallon. Remember that highgravity beers will need a higher pitching rate, but severe overpitching of yeast can lead to harsh, yeasty flavors and accelerated yeast autolysis.

### Preparation: Aeration

Wort aeration is the second key step to fermentation preparation. As we have seen, oxygen plays an important role throughout the fermentation process. Studies have shown that excessive wort oxygenation is difficult to achieve even with pure oxygen and that worts will reach a maximum oxygen saturation level, after which more O<sub>2</sub> just won't dissolve. So shake away at those carboys as long as your arms hold out.

One good way to aerate is to attach a strip of metal, such as the pocket clip from a ball point pen (make sure it's clean and sterilized), to the end of the racking hose. The chilled wort then sprays out into the fermenter and picks up lots of air. Be sure to give the fermenter several minutes of good shaking afterward just to be sure. There are also aeration systems on the market that use a small oxygen stone and pure oxygen tanks. A 30-second blast from one of these systems will do the trick handily.

Higher gravity worts cannot hold as much O<sub>2</sub> in solution, and therefore they must be particularly well aerated.

### And Don't Forget...

There are a few additional points to remember about fermentation preparation. Yeasts that are cultured from pure cultures should be grown in a wort that is as similar as possible to the wort into which the yeast is being pitched. The more adaptation the yeast needs to undergo at pitching, the longer the lag time and the greater the

loss of viability.

Sugar should never be used as a culturing medium because of the changes the yeast will undergo. Proper wort composition relying on a malt base with a low proportion (less than 10 percent) of sugars should be observed.

Temperature control is an important tool to coerce the yeast into doing their work the way you want them to do it. Brew when ambient temperatures permit or employ some system of temperature control. Temperatures that are too high or too low or fluctuate greatly will undermine all proper preparations you have made.

Remember that yeast will do all of the hard work for you. If you treat them right and provide a good home for them to live in, they will reward you with great beer every time.

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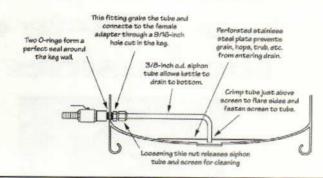
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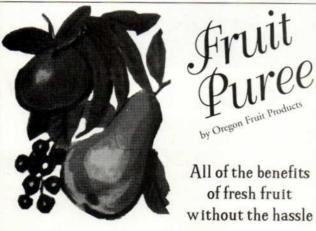


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### **How To Remove Trub**

by Alex Fodor

Creating a
clear beer without
filtering is a matter
of using simple methods
to reduce the amount
of trub that remains
in your brew.

Trub is chemically composed of proteins, tannins, hop compounds, and fatty acids. Physically it appears in the wort as amorphous little bits of beige matter. Hot break refers to trub that precipitates during the boil at temperatures above 212° F (100° C). Cold break describes trub that starts to form at 72° F (60° C) and continues to form as the temperature grows colder.

Between the boil and fermentation try to remove most of the trub. You'll end up with a cleaner-tasting beer. High levels of trub may cause off characters in the beer, such as sulfur compounds and fusel alcohols.

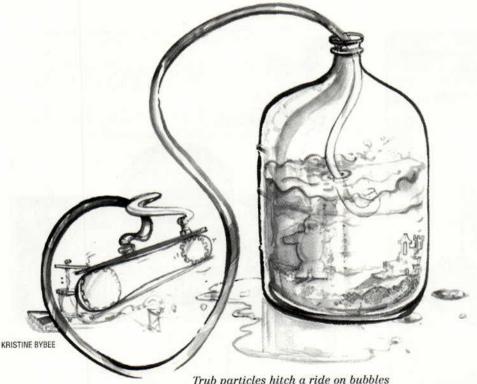
A poor break may also cause haziness in the finished beer as well as an increased stalling potential due to a higher tannin content. A high amount of trub in the yeast will decrease its vitality if the yeast is to be repitched into another beer. Removing trub is particularly critical for lager beers, because off-flavors are more easily perceived in lagers.

### When It's Hot

Several methods help remove hot-break trub.

- Boil vigorously to help coagulate protein-tannin complexes.
- Skim the sludge off the top of the foam during the boil.
- Add Irish moss to the boil. This fining agent, which is derived from seaweed, reacts with the proteins in the wort, encouraging them to form trub. Irish moss may be added 15 minutes before the end of the boil.
- · Whirlpool the wort. Whirlpooling is the process of running wort into a cylindrical vessel at an angle that causes the wort to stream around the inside of the vessel (as opposed to filling up from bottom to top). As the hot wort moves in a circular motion, the trub and spent hops form a cone in the center. The wort is then decanted off of the solids and cooled. This may be difficult for homebrewers, since a whirlpool would require designing a new piece of equipment. Furthermore, the hot wort should enter the whirlpool at a high speed. Gravity flow may not develop enough speed to facilitate a good break.

A simple alternative is to stir the entire wort in a circular motion with a sanitized spoon for a few minutes,



Trub particles hitch a ride on bubbles from a fish-tank aerator and settle on foam, where they can be skimmed off.

then cover and allow the solids to settle for 10 minutes. The clear wort can then be racked off of the solids into another vessel, where it can be cooled with an immersion chiller. An immersion chiller also can be carefully placed directly into the kettle so that the break on the bottom is not stirred up. The beer can then be cooled and racked.

• Use a hopback. A sieve or hopback is basically a rough filter to remove trub and impart hop aroma. The hot wort along with whole hops is run into a vessel with a false bottom or straining device. As the wort flows through the bed of hops, the trub particles are filtered out. The hot wort can be run from the kettle through the hopback into another vessel with an immersion cooler in place. The cooled beer can then be racked off the cold break that forms during cooling.

### When It's Cold

To remove cold-break material, try these methods.

- Settle in the kettle and rack.

  This method calls for cooling the beer in the kettle and allowing hot-break and some cold-break material to settle out. The cooled wort is then carefully drawn off the trub. This method allows much of the cold-break material through to the fermentation, since it will continue to form as the beer continues to cool.
- Use a sedimentation vessel. This is possibly the easiest and most effective method of removing cold break. After the wort is cooled, it can then be racked into an empty sanitized carboy. The trub should be allowed to settle and the wort should be racked again into a vessel for pitching and fermentation.
- Use flotation. This method of removing cold-break trub also oxygenates the wort. After the wort is cooled, it is racked out of the kettle and into a second sanitized vessel.
   Here it is aerated from the bottom with a line from a fish tank aerator or air compressor. To avoid contamination an

in-line air filter can be constructed or purchased from a medical supply house. As the tiny air bubbles float to the surface, the trub particles hitch a ride and settle at the top of the foam, where they can be skimmed off.

### How Much to Remove?

For the homebrewer separating trub can be a trade-off between removing the goopy stuff and risking contamination during the sensitive period between the boil and the start of fermentation. Many of the techniques that remove trub can also expose the wort to contamination if careful sanitation is not practiced. Absolute trub removal is not only unnecessary, it actually produces a less active fermentation. A small amount of trub will provide muchneeded fatty acids for the yeast. Using a combination of the above methods should remove enough trub to avoid off-flavors while still providing adequate fatty acids for a healthy fermentation.





You've Never Heard OF

### Lagers, Not Loggers

by Stan Hieronymus and Daria Labinsky

902

Paul and Deb McGowan,
partners in Hollister
Mountain Brewing,
believe their business
will grow into its 2,900square-foot building.

t's fun when you go out, when a bartender says to customers, 'There's the guy who brews this beer,' and they say, 'Hey, you brew great beer,' says Paul McGowan of Hollister Mountain Brewing Ltd. Co. of Coeur d'Alene, Idaho.

Hollister Mountain is still small and struggling ("We're almost paying our bills," McGowan says) but it's garnering acclaim, much of it by word of mouth. "People call us on the phone to tell us how good our beer is," says his wife, Deb. The McGowans are two of the owners of Hollister Mountain, and Greg and Deb Piller are the other two. Paul and Greg were homebrewers who met about two years ago. The Pillers for years had been tossing around the idea of opening a brewpub to be called Hollister Mountain after a nearby peak. The McGowans, meanwhile, had considered opening a pub. The four decided a microbrewery was a better idea. A Scottish theme evolved and with it the slogan, "Whatever blows your kilt up."

Paul McGowan and Greg Piller work full-time at local logging mills on opposite shifts, so they take turns running the brewery. (Before you haul out the "lager" jokes, realize these guys aren't actual loggers.) Greg and Deb Piller do the majority of the sales work. Paul McGowan handles the day-to-day brewing, while Deb McGowan does the graphic art and marketing, designing table tents, advertising, logos, and labels on her personal computer. "We have talents in different areas, and we're all versatile," Deb McGowan says.

The four owners found a suitable building, a one-story, former Dr.
Pepper bottling plant, which was later a Polar Ice plant and then a sheet metal building. It required some work, but the 2,900-square-foot building, which they lease, provides ample room for the existing equipment and space to grow.

The open primary and closed secondary fermenters, cooler, directfire gas kettle, and some other equipment were purchased new. A mash tun, hot liquor tank, and primary fermenter are reconditioned



dairy equipment, and one cooler still has an A & W logo on it. "We got it and a cigarette machine at an auction for \$20-something," Paul McGowan says. "We busted open the machine and found \$15 or so in change" — making the cooler an especially good deal.

The brewery has a small office, a large, clean, white-walled room that holds all the brewing equipment, a large cooler that holds tanks and kegs, and an adjacent room with more kegs. The 15-barrel brewery is capable of producing 300 to 340 kegs a month but as of late August was brewing only once a week.

Hollister Mountain's beer recipes are based on homebrewing recipes which, after a little trial and error ("I dumped maybe four batches," McGowan says), resulted in some pretty nice beers. McGowan found that hop utilization proved the biggest challenge when enlarging the recipes. "Aroma's the hard thing," he says.

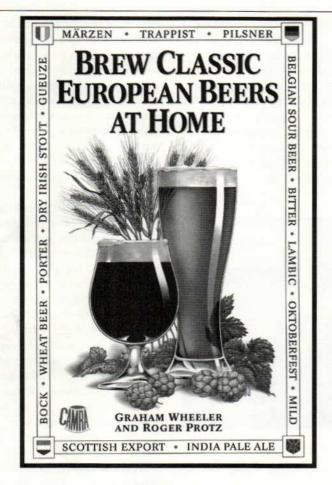
Hollister Mountain began brewing in September 1996 and distributing Oct. 1. The first beers brewed were a pale ale, porter, rye, and Scottish ale. All are made with a London strain of English ale yeast, which is repitched eight to 10 times before another is used. The brewers use local city water with a little gypsum added to bring down the pH. Most of the malt comes from Great Western. Some is imported, and the hops are both American and European.

Keepers Pale Ale — "made for one of the most important people in the brewery: the cellar keeper," according to a poetically licensed Hollister Mountain brochure — is an amber ale made with English Fuggle and Styrian Goldings hops. The Fuggles come through in the aroma, and the hop bitterness is evident throughout, yet there is enough malt to be noticeable as well. It has 28 International Bittering Units and is 3.6 percent alcohol by volume.

One-Eyed Raven Porter — "ominous and dark, but chocolatey and delicious" — is a full-bodied, malty beer, with hops, chocolate, and licorice coming through as it warms. Made with roasted and chocolate malts, it has 28 IBUs and is 4.8 percent ABV.

Fieldstone Ale — "from the spirit of the people who turned the soil and piled the stones" — is a light-copper beer made with malted rye and Hallertauer and Mt. Hood hops. It has a lightly sweet nose and hints of caramel, and the rye is pleasantly noticeable. Fieldstone has 26 IBUs and weighs in at 3.4 percent ABV.

Claymore Scottish Ale — "as enjoyable as a



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The two men behind this guide are Graham Wheeler and Roger Protz, two of Britain's foremost authorities on home brewing and editor of CAMRA's newspaper "What's Brewing". Many of the recipes in this book are once closely-guarded brewery recipes. This book is available at homebrew retail stores.

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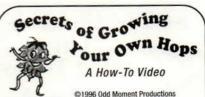
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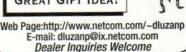


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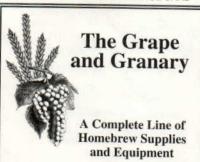


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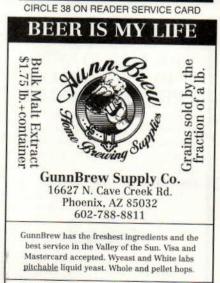
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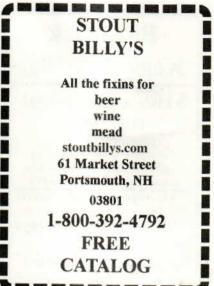
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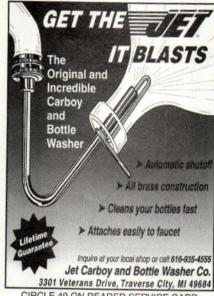


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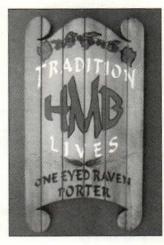
North Atlantic breeze on a summer field of heather" — is the most popular of the first four beers Hollister Mountain brewed. It's a deep copper brew along the lines of an 80 shilling ale. A variety of specialty malts combined with East Kent Goldings hops result in a full-bodied beer that's more malty than hoppy. It has an ABV of 4.9 percent and is 26 IBUs.

Over time the brewery added three more beers, for a total of seven yearround. "I was dying to do a stout," McGowan says. Bog Water Stout (which, McGowan says, some folks mistakenly call "Bong Water Stout") is a jet-black elixir that has notes of chocolate, coffee, and licorice. It's made with East Kent Goldings at 45 IBUs and is 4.5 percent ABV.

Next came the popular Shanghai Bitters, Shanghai being a way to score 100 points in the darts game Killer and to win in Russian Killer. "Pale ales are such a competitive market here. We called it 'bitters' and it took off," McGowan says. It is based on a classic English-style bitter, slightly lighter in hops but higher in alcohol than the pale ale, at 25 IBUs and 4.3 percent ABV.

Third was Wet Willy Ale, an American wheat ale. "I was flat against doing a wheat beer, but the other three owners pushed for the wheat,"

One-Eyed Raven Porter, advertised on this handmade sign, is described as "ominous and dark."



by women," Deb McGowan says.

Planned for winter is an Englishstyle strong ale, brewed in October and called Old Angus 1997.

The beers are unpasteurized and unfiltered, but most pour quite clear. They undergo primary fermentation for 48 hours to five days. "The yeast will finish a beer in 30 to 36 hours, but we crank the temperature down to slow it down," McGowan says. Wet Willy ages for eight to 11 days, while the stout and Scottish ale condition for a few weeks. The beers are force carbonated slowly for 24 to 48 hours.

Hollister Mountain beers can be recognized on draft by their distinctive



Most of the equipment is made from reconditioned dairy tanks, including this mash tun. left, and open fermenter, right.

McGowan says. "Before someone said 'fruit,' I agreed to the wheat. Now, it's our best seller." Wet Willy is made with the same English ale yeast as the other beers, 30 percent wheat malt, and Hallertauer hops, with 18 IBUs and 3.9 percent ABV. "The wheat is really liked tap handles. Bog Water Stout, for example, has a drawing of a hand reaching out of an oozy swamp. Shanghai Bitters wears a dartboard handle with a dart feather sticking out the top. Additionally, Deb McGowan has made personalized wooden signs

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The brewery can self-distribute in the Coeur D'Alene area, while other distributors, including Anheuser-Busch distributors, handle them elsewhere. "We can give better service when it's just us, but it was a little hectic at first," Deb McGowan says. They hope to hire a salesman soon.

As of late August, the beers were on draft at more than 30 accounts in many Idaho counties and in Spokane, Wash. "We do well in micro bars that do well *even in* Rainier towns," Paul McGowan says. The brewery was also planning to contract with an "itinerant bottler" who travels around with a small Meheen system.

The owners financed the brewery with the help of a Small Business Administration loan. "No one's going to be a millionaire off this," Paul says, but Deb McGowan adds, "The last couple of months (business) turned around, and I don't foresee sales dropping off at all. Winter is better for selling beer."

The brewers had no formal technical training, and Paul says he wishes he had the luxury of time and money to take some brewing courses. "My goal is, when we're up and running and we both quit our jobs and work here full time, to take a short course," he says. "But I know a lot of technical brewers who can't brew worth a crap. Brewing is 40 percent science and 60 percent art. You have to be able to taste your beer and know what's wrong with it."

"I think we have a good, quality product," Deb McGowan says. "Certain styles come and go, but we have consistency in our product, and I think that's what's important."

Hollister Mountain Brewing Ltd. Co. is located at 902 Lincoln Way, Coeur d'Alene, Idaho 83814. (208) 667-1918. ■

Stan Hieronymus and Daria Labinsky are authors of the Beer Travelers Guide, which lists more than 1,700 brewpubs, bars, and restaurants in the United States that serve flavorful beer.



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#### Organic Homebrew

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#### Big Batch Supplies

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The multifunction fermenter features a stainless 15.5-gallon barrel with ball lock fittings for pressure transfer, adjustable racking arm, thermometer, a removable gasketed lid for cleaning, and more. Smaller units, 7.75-gallons, are also available.

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Aug '97 Nov '95

Aug '96

Style of the Month: Doppelbock Tips from the Pros: Brewing Wheat Beer Style of the Month: Witbier Style of the Month: Weiss Beer Style of the Month: Steam Beer Style of the Month: "Other" Stouts Style of the Month: Rauchbier Style of the Month: Robust Porter Style of the Month: Modern Althier Style of the Month: Märzen Style of the Month: New Age India Pale Ale Style of the Month: Fruit Beer Style of the Month: European Pilsner Month: Traditional IPA Month: English-style Mild Ale onth: Stout onth: Scotch Ale Porter Oud Bruin Munich Dark Lager Jun '97 Aug '97 Dec '97 Nov '95 Sep '97 May '97 Oct '96 Aug '95 Nov '97 Feb '96 Sep '96 Mar '97 Feb '97 Mar '96



|           | Tips from the Pros: Improving Fruit Beers | Nov '97 |
|-----------|---|---------|
|           | Tips from the Pros: Simplify Your Stout   | Mar '97 |
|           | What Makes a Style                        | Feb '96 |
|           | Wheats of the World                       | Nov '97 |
|           | Winter Warmers                            | Dec '95 |
|           | Homebrewing for the Holidays              | Dec '97 |
| Body      | Add Body to Your Beer                     | Jun '97 |
| Boiling   | <b>Bubble, Bubble, Boil and Trouble</b>   | Apr '96 |
| Bottling  | Single Brewer Seeks Tall, Brown Bottle    | Sep '95 |
|           | Tastes Great, Less Filling                | Nov '95 |
| Breweries | Acadian Brewing Co.                       | Aug '97 |
|           | Atlantic Coast Brewing                    | Jan '96 |



Oatmeal Stout, Oct. '97

# Bar Harbor Brewing Jul '96 Big Sky Brewing Oct '96 Blind Man Ales Brewery Mar '96 Blind Pig Brewing Nov '96



Take Control of Fermentation, Mar. '97

| Boyne River Brewing Co.     | Sep '97 |
|-----------------------------|---------|
| Blind Man Ales Brewery      | Mar '96 |
| Diamond Knot Brewing Co.    | Jul '97 |
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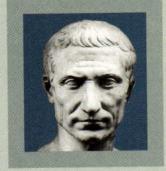


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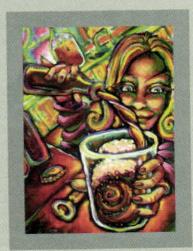
| High Point Wheat Beer Co.  | Nov '97 |
|----------------------------|---------|
| Highland Brewing Co.       | Sep '95 |
| Hollister Mountain Brewing | Dec '97 |
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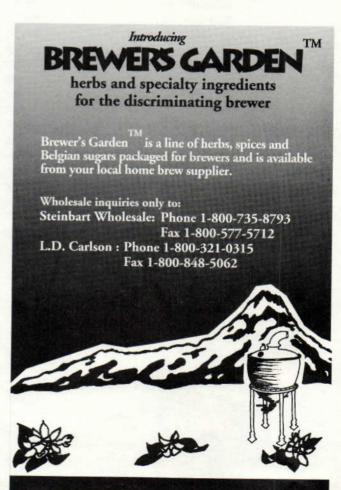
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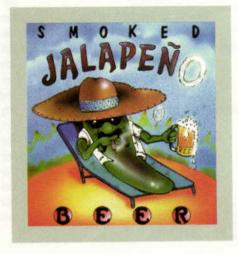
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# Homebrew Pen Pals

by Scott Parr

Il-Grain Newbie from Spain.
That was the subject line of a posting I recently found on an Internet bulletin board about homebrewing. I always like to help out newbies when I can, and I twice visited Spain as a student of foreign languages. "I'll help him out," I thought.

In his message he introduced himself as Antonio. He said that homebrewing had not yet caught on in Spain. There were no homebrew supply stores, no homebrew clubs, and no homebrew literature. He had brewed some kit extract beers and collected most of the necessary equipment. He was anxious to move into mashing. Now he was soliciting advice.

I e-mailed a note back, telling him I'd been mashing for about two years and had won a couple of ribbons for my all-grain beers. I offered help in exchange for news on what things are like in Spain these days. "First of all, tell me about your equipment and what ingredients you have and we'll take it from there. Agreed?" I asked.

Antonio's reply came back the next day. He lives in Murcia on the Mediterranean Sea. He had driven 500 kilometers to buy an 80-kilogram bag of uncrushed pale pilsen malt from a maltser in Albacete and had ordered hops and yeast from a supply house in Belgium. (I immediately admired his dedication.) He also had designed and built his own lautering system and wort chiller but had no way to crush his grain, no recipe, no specialty malts, and a limited selection of yeast strains.

I e-mailed him a simple recipe and instructions for crushing (with a rolling pin), mashing, and sparging with all the temperatures, volumes, and weights converted into metric values. I also told him about myself and my wife Amy, that we just bought our first house, and how excited we were. "By the way, one of my other hobbies is

cycling," I said and jokingly asked if he could get me an autographed photo of Miguel Indurain, the world champion bicycle racer from Spain.

And so it went for about two months, e-mailing back and forth, exchanging information about brewing and about each other. We had become "virtual neighbors." One thing was missing, though: "How do we share a



Thanks to e-mail and airmail Antonio and I share our love of brewing even though we're 10 time zones apart.

homebrew with each other when we live 10 time zones apart?"

Then one day my wife brought home a glob of bread dough that a friend had given her. It was for making "Amish Friendship Bread," and the dough was actually a starter with live yeast in it. You use it to make more bread dough, then you save a glob and give it to a friend who makes more dough using your glob as a starter and so forth. In this way dozens of families could make loaves of bread from

virtually the same dough — in effect as if they were all doing it together! It didn't take long for me to come up with the idea for "Friendship Homebrew." Sending yeast to Spain would be much easier than sending a bottle of beer. Cool

"Scott," he wrote back, "that is a great idea. You can't imagine how happy that would make me. By the way, I know somebody who knows somebody who lives near Miguel Indurain. No promises, but I'm trying to get that autographed photo for you."

I had just brewed an American pale ale and saved a flask full of yeast slurry from the primary fermenter. What better brew to share with Antonio than an American ale with lots of Cascade hops. I came up with a scaled-down metric recipe to fit his fermenter and titled it La Pocima Casera de la Amistad, or Friendship Homebrew. I bought some specialty grains at my local supplier, measured the Cascade hop pellets, and sent it with the harvested yeast slurry, the recipe, catalogs, brewing literature. and of course a photo of my wife and me in front of our new house so Antonio would really feel like a neighbor.

As I dropped off the package I had an intense feeling that I was participating in something truly extraordinary, and I'm proud to tell you the whole scheme worked out great. Antonio brewed a beer like nothing he'd ever tasted before (he described it as maravillosa), and he's planning his fourth all-grain batch. He still drops by frequently to talk about homebrewing and to ask how I'm doing, just like any neighbor would. And I'm still hoping for an autograph of Miguel.

Do you have a 750-word story for Last Call? Mail it with a color photo to Last Call, c/o Brew Your Own, 216 F St., #160, Davis, CA 95616.

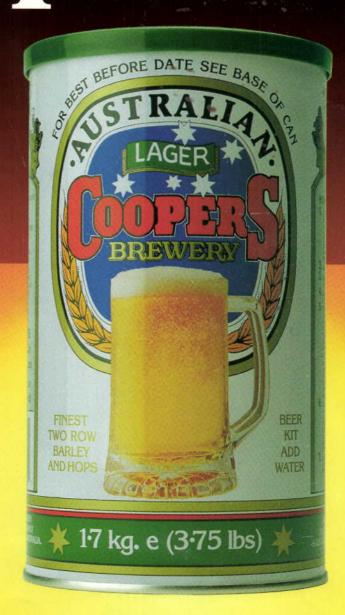
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