

Brew

YOUR OWN

March 1999, Vol.5, No.3
Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

**4 CLASSIC BEERS
AND HOW TO
MAKE THEM!**

**20 Facts
Every Brewer
Should Know**

Bottling Made Easy

**Blending Like
the Pros**

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It's Label Contest Time

It's time once again for the annual extravaganza that, I have to admit, is my favorite event of the year. It's label contest time!

This year marks the fourth BYO label contest. The creativity of some of the labels we receive each year is amazing. Remember the copper label with the rivets on it? Or the pirate label with rope attached in the form of a ship's ladder? Boo's Brew, the glow-in-the-dark label? How about the bottle with the tiny label and the magnifying glass attached — "micro-brewed and microlabeled"?

Each year we receive hundreds of entries and give away dozens of prizes — prizes such as brewpots, conical fermenters, counterpressure bottle fillers, mini-kegs, tap handles, kits, and more.

The deadline for entries is March 22, so if you haven't started working on yours yet, what are you waiting for! Check out the entry form on page 61.

Here are a few hints:

Creativity counts! Different and unusual labels always catch the judges' attention. Railway Ale with a picture of a train might make a nice label, but I guarantee you won't be the only one with that entry.

Looks matter. The winning labels have to reproduce well in the magazine, so send the best version of your label you've got. We can't tell from a black-and-white photocopy that your label looks great in pastels.

The judges have a sense of humor. A little odd, maybe, but it's still a sense of humor. Believe me, anything funny or off-beat gets noticed.

Words work, too. You can win with a great name for your beer, a funny warning label, a good description. We read all the letters people send with their entries, too.

Do you have a funny story about how the beer got its name? Did you use an interesting method to create your label? Write it down.

Finally, here's a challenge. Do you have a photo of yourself with a famous person? Make it into a label and address your entry to my attention. Past entries have featured Dan Quayle, Bill Clinton, and Richard Jewel, the hero/suspect/hero again from the Atlanta Olympics bombing. Can you do better? Say a beer with lots of body — and Jesse Ventura on the label? I'll make sure the judges take notice if you do.

This month's issue features a few topics to get you in the mood for labeling. First, there are some terrific recipes: Scott Russell's cover feature on four classic beers (page 32) and Mik Weaver's Style of the Month on dunkelweizen and ESB (page 13). Craig Hartinger gets to the heart of the matter with his excellent practical look at bottling (page 20). He offers plenty of tips to make the process easier and more fun. After all, the sooner you do it, the sooner you get to affix those creative labels to their proper place — a bottle of great homebrew.

Jim Harris did that. A few months back he sent me a few bottles of terrific homebrew, which I enjoyed very much. Thanks for the beer, Jim. And I'll make sure the judges see your labels; that makes you the first entrant. I just wish you had included your address.

Craig Bystrynski

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Brew Like a Babylonian

Dear Brew Your Own,

I am looking for a beer recipe I had in the 1980s or early '90s, Babylonian Beer. It was in an archaeology magazine. But I have moved twice since then and lost it. Do you know how I could get a copy of it?

Judith Prueitt
via e-mail

This beer is not easy to make. The recipe is derived from a Sumerian tablet that is actually a prayer to the goddess of harvest, Ninkasi.

The prayer neatly describes the process they used to brew. The beer was made from two-thirds malted barley and one-third barley bread made from barley, roasted barley, malted barley, and honey.

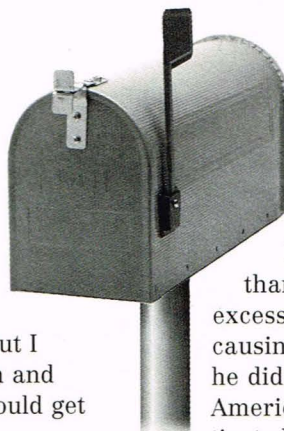
The original gravity is around 1.087, and the final (apparent) gravity is 1.023. An upward infusion mash is used, and a syrup of dates is added to the final mash temperature. The wort is not boiled, and no hops are added. Because modern cooling methods were not available to the Sumerians who wrote the tablet, you'll need to cool the wort gradually to simulate the traditional style and then pitch with a standard ale yeast.

It is also thought that the bread was probably twice-baked. If you are going to do this at home, bake the bread once, slice it, and bake it again as you would biscotti.

Are You Aerating That?

Dear BYO,

In an answer to a letter in the June '98 BYO, you said that "...aerating the wort when still hot won't harm anything..." You will have to tell the author of "Brewing Like the British" (December '98 BYO) that hot-side aeration is fictitious. Perhaps he already knew this, so in his line "The English homebrewer



is much more likely to be opening a can of extract and

boiling it on the stove than worrying about excessive wort splashing causing hot-side aeration," he didn't mean that Americans are more sophisticated homebrewers but actually that we waste our time worrying about non-existent homebrew bogeymen.

How about an experiment run by an independent third party and written in a future edition of BYO to confirm or deny the existence of HSA?

Dan Cole
Roanoke, Va.

HSA discussions in homebrew circles are largely fueled by a small number of individuals, some without much in the way of brewing-science background. Still, it must be said that there will be years of work needed before HSA can either be confirmed or denied.

However, the article implies that there are many, many more aspects of homebrewing to worry about before one needs to start worrying about (the possible existence of) HSA.

HSA might be a factor in extremely light, highly adjuncted beers with long expected shelf lives. However, as anyone who has tried to aerate a batch of cold wort knows, aerating cold wort is hard enough — in hot wort, air just doesn't want to dissolve. Damage to homebrew is far, far more likely to be caused by post-fermentation aeration than by any possible HSA effects.

Eisbock Carbonation

Dear BYO,

The recipe for eisbock ("Eisbock: Brew the Beer Money Can't Buy," January '99 BYO) calls for no priming. Since the final gravity is so low, how does the beer re-ferment so as to produce

additional carbonation in the bottle or keg?

*Steve Shapson
Milwaukee*

The first set of recipes (Reichelbrau type) calls for the final gravity to be about 3° Plato (1.102). The beer is then frozen and the ice is removed (5 percent to 10 percent). This process increases the concentration

of the residual sugar. The recipe's 3° Plato is roughly equivalent to 3 percent sugar, which is driven higher after concentration (the EKV recipes are 4 percent to 5 percent sugar before concentration).

This should be enough sugar for the yeast to feed upon during conditioning. Remember, this is not a beer that you drink right away. The recipe calls for aging in the bottle

at least four weeks, but really it should go for as long as you can stand it (although a month is long enough for the residual yeast to go to work). The longer you age it, the higher the carbonation and alcoholic strength.

If you are concerned, you can: 1) finish the fermentation higher, 2) concentrate the beer more, or 3) add a small amount of sugar at bottling time.



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Kegging for Style

Dear BYO,

I am very excited about the return and the new format of Style of the Month. I plan to follow it through the entire year.

I usually keg my beer. I am assuming that when it is time to bottle, it is also time to keg and force carbonate. Is this correct? If I want to bottle some of my beer to save, how much priming sugar should be used for a 22-ounce bottle?

*Scott A. Leonard
Santa Monica, Calif.*

Kegging should be done at the same time as bottling. Don't forget to leave out the priming sugar if you force carbonate.

For a 22-ounce bottle, about a teaspoon of priming sugar gives strong carbonation (the equivalent of three-quarters cup for a full batch). Adjust the amount based on the style being brewed.

If you are able to weigh your priming sugar, try 4.8 to 5 grams for a 22-ounce bottle, 2.5 grams for 12 ounces, and 140 grams for a five-gallon batch.

I've Seen the Hop Light

Dear BYO,

The article about hops IBUs and the formula ("Alpha-Hop Soup," January '99 BYO) was very insightful. I never realized this was the correct procedure for getting the exact amount of bitterness. I will never again make an over-bitter brew.

*Pat Whitbeck
via e-mail*

CIRCLE 4 ON READER SERVICE CARD

Christopher Benson Coventry, R.I.

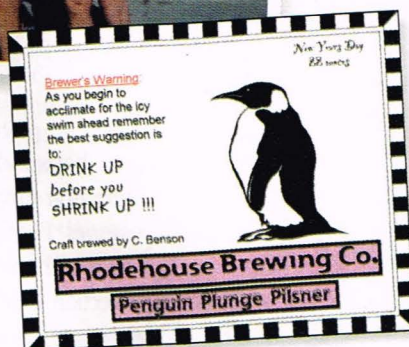
For the past three years I have found myself drawn to the icy waters of Jamestown, R.I., on January 1 to participate in the annual Penguin Plunge with eight to 10 friends. The plunge is a fund-raising event that finds 400 to 500-plus people just crazy enough to support the Rhode Island Special Olympics by running, jumping, splashing — or, as we prefer, calmly entering — the frigid Atlantic Ocean (average water temperature is 38° to 40° F).

As part of the acclimation process we dress up in some pretty crazy costumes — I'm the one dressed as "Baby New Year" — and of course enjoy a few homebrews (Rhodehouse Brewing Co. is the name of my garage brewery).

As we gather each year to enjoy this time and homebrew beers such as Penguin Plunge Pilsner, we can't forget to pass on our motto: "Better Drink Up Before You Shrink Up."



Christopher Benson and friends down a few homebrews before adjusting to the frigid Atlantic Ocean each year to raise money for Special Olympics.



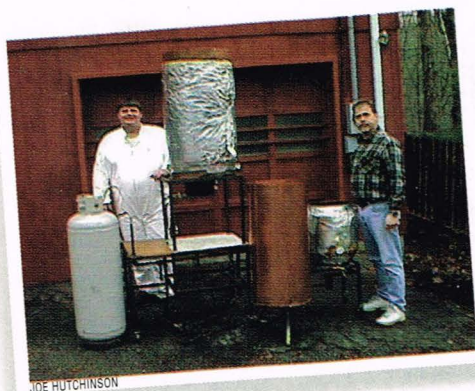
Keith Bugg, Oak Ridge, Tenn. Glenn Sizemore, Mt. Sterling, Ky.

We believe bigger is better, so we built this brewery to maximize our productivity while minimizing our cost. We quickly realized we were spending a lot of time brewing five-gallon batches, and we came up with this solution.

We built a one-barrel (31-gallon) system using surplus parts and our own mechanical inclinations. The mash tuns are #303 stainless steel beer kegs fitted with a flat bottom, a thermometer, and a false bottom. We mash and lauter in the same tun, transferring the runnings to the boil kettle via a graduated bucket.

All of the copper fixtures are made using silver instead of a lead-based solder. The sparge arm is an ingenious rotating arm drilled with

extremely small holes. A magnetically coupled pump moves product from the boil kettle through a counterflow wort chiller to the fermenters. Large-scale brewing not only cut our costs dramatically but has given us invaluable experience toward maybe opening a real brew-on-premise or microbrewery.



Keith Bugg and Glenn Sizemore show off the one-barrel brewing system they built from scratch.

BREWING RITUALS

Do you have a special or unusual brewing ritual? Tell us about it and send us a picture of yourself. There's a cool BYO T-shirt in it for you. Send your story to Pot Shots, 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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CIRCLE 1 ON READER SERVICE CARD

It's Not Just for Breakfast

by Scott R. Russell

I hadn't intended for this month's column to reveal yet more of my childhood memories. Honestly, I had planned to give a straightforward, no-nonsense recipe and style history. But somewhere between the initial recipe design and the writing stage, a time warp or something happened.

I was temporarily transported back to the late '60s, to a Saturday morning in suburban central Massachusetts, to a living room with a television, and on that television the roadrunner was being chased by the coyote once more, and two young boys in pajamas were watching, laughing, and eating breakfast. Unbeknownst to them

then, both of those boys would grow up to be homebrewers.

At that particular time, as far as they knew, beer was that yellow stuff that came in clear bottles (Dad drank Miller back then), and certainly one of the furthest things from their minds was the idea that anyone could make their own at home and that it might look and taste different from what Dad drank.

Well, here we are, my brother and me, and now we know better. But what would we have done with that knowledge back then if we had been able to see into the future? That's where this childhood memory

comes in. As kids, the coolest thing in the world to us was cereal. Mom tried her best to get us to eat right most of the time — whole grains, no sugar, no artificial stuff — but breakfast cereal was almost sacred. Every trip to the grocery store, we each were allowed to pick out a box of cereal. We usually chose it based on the prize inside, of course, but every once in a while we were taken by a picture on the box or the thrill of something new.

Now, Dad was in advertising, and every once in a



Choctoberfest (5 gallons, partial mash)

Ingredients:

- 2 lbs. pilsner malt
- 0.5 lb. carapils malt
- 2 lbs. Munich malt
- 0.5 lb. Vienna malt
- 0.5 lb. crystal malt, 60° Lovibond
- 4 lbs. unhopped light dry malt extract
- 1 oz. Tettnanger hops (4% alpha acid): 0.5 oz. for 60 min., 0.5 oz. for 5 min.
- 1 oz. Spalt hops (5% alpha acid): 0.5 oz. for 15 min., 0.5 oz. for 5 min.
- 4 Tbsp. unsweetened ground cocoa
- 1 qt. slurry of Wyeast 2308 (Munich lager) or similar
- 2/3 cup corn sugar for priming

Step by Step:

Heat 1.75 gal. of water to 166° F, mash in cracked grains. Hold at 154° F for 90 min. Sparge with 2.5 gal. water at 169° F.

Add dry malt extract to kettle

and bring to a boil. Total boil is 60 min. Add 0.5 oz. Tettnanger hops, boil 45 min. Add 0.5 oz. Spalt hops, boil another 10 min. Add the rest of both hops and the cocoa, boil 5 more min. and turn off the heat. Add to fermenter along with enough pre-boiled and chilled water to make 5.25 gal. Cool to 60° F. Pitch yeast.

Seal and ferment cool (55° to 60° F) for two weeks. Rack to secondary and age cold (40° F) for six to eight weeks. Prime with corn sugar, bottle, and condition at 50° F or below for four months (or until the end of September, whichever comes later).

OG = 1.068

FG = 1.018

16 IBUs

Alternatives:

All-grain version: Increase pilsner malt to 8 lbs., mash water

to 4 gal., and sparge water to 5 gal. Adjust boiling time to suit your rate of evaporation and maintain the hop schedule as above.

All-extract version: Omit the pilsner malt, reduce Munich malt to 1 lb. Steep all grains in 2.5 gal. of water at 150° F for 30 min., then remove grains and bring liquid to a boil. Increase malt extract to 6 lbs. and proceed as above.

A note about cocoa: Cocoa and hot chocolate mix are not the same thing. In this recipe (and elsewhere in your brewing adventures) you only want to use cocoa, that is, the extract of the cocoa bean, not a prepared chocolate containing milk solids, sugars, preservatives, and so forth. Try for the most pure cocoa you can find, unsweetened, unpreserved.

A word of caution: Cocoa contains lipids and fats, which reduce foam retention.

while he got to bring home samples of a new product that a distributor had given him. And on this Saturday morning I'm remembering, we were devouring just such a sample — two new breakfast cereals with monsters on the box and flavored marshmallow nuggets in with the cereal.

One had a Frankenstein-type creature on the box and was strawberry flavored. The other had a vampire and was chocolate flavored. I'm sure you remember them.

My theory goes like this: If I had known then what I know now, if I had had an inkling that I would someday be a homebrewer, I would have blended that childhood cereal with my favorite beer. And the result would have been (ta dah!) — Choctoberfest.

Readers' Recipes

Absolute Apricot (5 gallons, extract)

This is a light and refreshing fruit wheat beer. You can use any type of natural fruit flavoring.

Gary Lee

*Old West Homebrew Supply
Colorado Springs, Colo.*

Ingredients:

- 8 lbs. Alexander's wheat malt extract
- 2 oz. Hallertauer whole leaf hops (3% alpha acid) for 60 min.
- 8 oz. maltodextrin
- Wyeast 1056 (American ale)
- 4 oz. apricot natural flavoring
- 3/4 cup corn sugar for priming (or 1 1/4 cups dry malt extract)

Step by Step:

Boil extract, hops, and maltodextrin for 60 min. in 5.5 gal. of water. Cool to 70° F and pitch yeast.

Ferment 10 to 12 days. Prime with corn sugar or dry malt extract and add apricot extract to the bottling bucket. Bottle, age, and enjoy.

OG = 1.055
FG = 1.015
21 IBUs

Carlisle PA (5 gallons, extract with grain)

This is a full-bodied, deep amber, American IPA that is popular at our store.

*The Brew Company of Carlisle
Carlisle, Pa.*

Ingredients:

- 1 Tbsp. gypsum
- 1 lb. English crystal malt
- 2 oz. roasted barley
- 6 lbs. Muntions pale malt extract syrup
- 3 lbs. Muntions light dry malt extract
- 1.5 oz. Columbus hop pellets (13% alpha acid) for 60 min.
- 1 oz. Northern Brewer hop pellets (8.5% alpha acid) for 30 min.
- 1 oz. Liberty hop pellets (4.5% alpha acid) for 5 min.
- 1 oz. East Kent Goldings hop pellets (5.4% alpha acid) for dry hop
- 1/2 tsp. Irish moss
- Wyeast 1335 (British ale II)
- 3/4 cup corn sugar for priming

Step by Step:

Add gypsum to 2.5 to 3.5 gal. of cold, unchlorinated water. Steep crushed grains for 20 min., gradually raising the temperature from 140° to 180° F.

Remove grain and add dry malt extract. Bring to a vigorous boil. Total boil is 60 min. At vigorous boil, add Columbus hops. Boil 30 min. and add Northern Brewer hops. Boil 25 min. more and add Liberty hops and Irish moss. Boil 5 min. more. Chill wort and rack to the primary fermenter. Bring the total volume to 5 gal. by adding cold water. When the wort temperature drops below 80° F, mix and aerate it very well. Pitch yeast at 75° F.

Ferment five to seven days at 65° to 70° F. Rack to secondary fermenter and add East Kent Goldings. Let sit for two weeks or more. Prime, bottle, and condition for two weeks.

OG = 1.058
FG = 1.015
75 IBUs
5.5% ABV

"Veruyu" California Red Ale (5 gallons, partial mash)

This is a finely balanced, red-dish brew with California-style aromatics.

*Byron Burch
The Beverage People
Santa Rosa, Calif.*

Ingredients:

- 12 oz. medium dark crystal malt, 60° Lovibond
- 8 oz. dark crystal malt, 90° Lovibond
- 3.3 lbs. Edme Maris Otter pale malt extract
- 3.3 lbs. Edme amber malt extract
- 0.5 oz. maltodextrin
- 1 tsp. gypsum (omit if using hard water)
- 1/4 tsp. calcium chloride
- 1/2 oz. Columbus hop pellets (13% alpha acid) for 60 min.
- 1/2 oz. Cascade hop pellets (6% alpha acid) for dry hopping
- 1 pint starter of Wyeast 1028 (London ale)
- 3/4 cup corn sugar for priming

Step by Step:

Start Wyeast culture in advance, following package directions.

Steep grain in approximately 150° F water for 60 min. Rinse in strainer with hot tap water, collecting runoff for the boil and discarding grain.

Add malt extract, dextrin, gypsum, and calcium chloride to at least 2 gal. of water (preferably the full 5 gal.) and bring to a boil. At boil add Columbus hops and boil 60 min. Cool to room temperature, adding enough boiled and cooled water to make up 5 gal. in your fermenter. Pitch yeast. Add Cascade hops to primary fermenter.

Ferment until foam subsides (usually four or five days of active fermentation). If possible, move to topped-up carboy for three days of settling. Then prime with corn sugar and bottle. Let carbonate for a week or two at room temperature.

OG = 1.051
FG = 1012 to 1016
29.1 IBUs ■

Hard-Boiled Answers About Water

Mr. Wizard

What is the difference between temporary hardness and permanent hardness. I'm only 36, and we're not talking Viagra here! We are talking brewing water.

*James McQuay
via e-mail*

The most basic difference between hard and soft water is that hard water reacts with soap to form solid soap scum, and soft water does not form soap scum. The formation of soap scum on your skin is the reason that soap seems easier to rinse from your body when you shower with hard water.

Hardness in water is caused by the presence of calcium ions, magnesium ions, or both. As their concentrations increase, water becomes harder. The combined concentration of calcium and magnesium is frequently referred to as total hardness.

When hard water is boiled in the presence of carbonate (CO_3^{2-}) or bicarbonate (HCO_3^-) the calcium and/or magnesium ions react with the carbonate and bicarbonate ions to form solid calcium carbonate, magnesium carbonate, or both.

Much of the ground water in the United States is trickled through underground labyrinths of limestone (calcium carbonate) and has high concentrations of both calcium and carbonate. This is the type of water that really wreaks havoc on plumbing, especially water heaters. A large portion of the total hardness in this sort of water is composed of temporary hardness.

Temporary hardness is complex,

because its concentration is a function of the concentration of carbonates in relation to their reaction with calcium in magnesium.

Suppose your water has 100 parts per million of total hardness before boiling and 60 ppm of total hardness after boiling. This means it has 40 ppm of temporary hardness. The good

thing about temporary hardness is that it is easy to remove by boiling or through precipitation with lime (calcium hydroxide). Boiling and adding lime are two of the older methods used to soften water containing temporary hardness.

Permanent hardness is simply the hardness that is not removed by boiling. If your water is gypseous — that is it has passed through gypsum in the ground — it will contain calcium and sulfate. When gypseous water is boiled, very

little hardness is lost, because calcium is not precipitated by sulfate.

Many brewers add calcium chloride to their brewing water, and this is another source of permanent hardness. The good thing about permanent hardness is that it is stable. This applies more to commercial brewers than to homebrewers, but if water is stored hot in large hot water tanks and contains temporary hardness, the concentration of calcium will change over time. This problem doesn't happen with water in which most of the total hardness is composed of permanent hardness.

One trivial point worth noting is

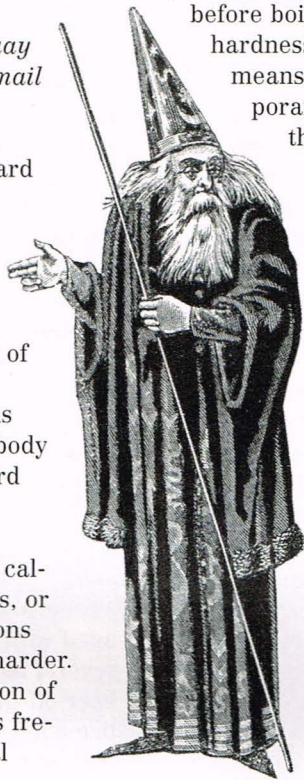
that distilled water adjusted with calcium sulfate still contains some temporary hardness because carbon dioxide from the atmosphere contributes a small amount of carbonate to water. This means that no teapot or bathtub is completely immune to calcium and magnesium deposits.

With modern water-treatment systems able to do just about anything to any sort of water, the difference between the two types of water is less significant than in the past. However, for homebrewers using local water without any major treatment, the difference between temporary and permanent hardness is important. A quick survey of traditional brewing centers reveals that the dark-beer cities have water dominant in temporary hardness and the cities known for light/pale beers are more skewed to the permanent-hardness side.

Mr. Wizard

I recently entered a brewing competition sanctioned by the American Homebrewers Association. My entry was American amber ale, category 6B. I tried to match every description given for this style. The beer, in my opinion, turned out very true to form. When the score sheets came back, the judges' conclusions were different. The two judges gave it a final score of 14 from a possible 50. Both said the beer was contaminated. One said it had cabbage-like aroma and added, "It could have been good; try the same recipe again." The other found phenolic aromas.

The next day, my wife and I opened a few bottles of this same beer and tried to find these same problems, but we could not. The color matched my color guide; the multi-ness was good with a slight ester of



banana and a light chill haze — all characteristics of the beer style. Is there any way for a homebrewer to detect such problems? How does one become an AHA judge?

*Shawn Smith
Steubenville, Ohio*

I have often expressed the opinion that homebrew and commercial beer competitions are flawed because of their subjectivity. It is very difficult to pick "the best" beer out of a field of many excellent beers because of the subjective nature of "best."

However, trained beer panels have a component of objectivity that should not be overlooked. In my opinion the real value of entering beer into competitions is for the objective criticism that they can give. The judges who gave you a low score because of an off-flavor provided objective feedback.

Beer judges, whether sanctioned by the AHA or trained for beer tasting by a commercial brewer, are trained to detect and identify the many different aromas in beer. To detect an aroma, a judge must be sensitive to the particular compound. Some aromas in beer, such as diacetyl, are very difficult for some people to smell because not everyone has the same physical ability to smell. In fact as people age, they lose their olfactory acuteness. However, most people are able to detect most of the key aromas in beer.

The next level of training is aroma identification. It is one thing to smell a beer and acknowledge that it has an aroma or to smell a spiked sample and detect an "off-note," but to correctly name the aroma is very different. Learning aroma identification is like training your ear to distinguish between the sounds of an oboe and an English horn; it takes practice. If your ear is properly trained and you comment that the trumpet solo in a particular recording is excellent, few will question whether the solo was indeed that of a trumpet player because of the objective nature of the comment.

In beer judging, if one trained judge detects an identifiable level of a certain off-flavor, evaluate your beer and decide for yourself to agree or disagree. If several judges detect the same off-flavor and you can't, I would tend to side with the judges. Since the judges don't know the beer they are tasting and should be making their observations without discussion, they have no motivation or bias to pull an off-flavor from thin air. You, the proud brewer of an amber ale, have many biased reasons not to identify the same defect.

The cabbage and phenolic comments sound like the aromas associated with a wild-yeast contamination or a wort-spoilage problem. A biased brewer could rationalize the cabbage as a slight DMS (dimethyl sulfide) aroma from a less-than-violent wort boil and the phenolic character as arising from the special yeast used for fermentation.

I have strong feelings about beer-defect training. I believe all brewers who really want to brew great beer should train themselves to detect off-aromas. This usually means enrolling in a training class that uses aroma standards. Think of it like identifying color. You would not be able to identify the color red if you had never been shown what red looks like. Aroma standards are invaluable when it comes to aroma training. After participating in a training class, you must practice aroma identification or you will lose it.

The down side of becoming a skilled beer sniffer is that the ability to identify an aroma as a defect immediately reduces the number of beers you can drink and enjoy because there is an awful lot of defective beer in the world.

In all likelihood your beer probably had an off-flavor that the judges objectively identified. Don't take it as a sign of failure; all brewers make the occasional flawed batch. The key is to detect the off-flavor before turning the batch of "Could-Have-Been-Great Lager" into the reason for a big party for all of your brewer friends.

Mr. Wizard

I'm getting ready to brew a batch of all-grain porter, and I plan to put a little cherry extract in the brew. When should I put the cherry extract in so I don't lose the essence and flavor? How much should I put in? I could do this based on trial and error, but that could take a long time.

*Kevin Hodkiewicz
via e-mail*

When flavoring beers with essences, it is best to add them after fermentation and prior to bottling. Most essences add no significant amount of fermentable sugars and don't do much for the beer other than adding flavor. Adding these flavors early in the process only reduces their impact in the finished beer.

Some fruit flavors do add a significant amount of fermentable sugar and should be added to the wort prior to or during fermentation. If you planned to add whole cherries to the porter, these would definitely need to be added to the wort during boiling or added to the fermenter while the yeast is still active.

Fruit beers such as lambics are aged with the fruit in the beer for several months before racking the beer off the fruit sludge. This practice allows the yeast to ferment the fruit sugars and, in the case of cherry beer, also gives sufficient time for some of the pit flavors to be leached into the beer.

Fruit purees are frequently used for fruit beers, and these also should be added to allow the sugars to ferment.

If you visit brewpubs that brew fruit beers and ask about their practices, you will find that many brewpub brewers add fruit flavors containing fermentable sugars to the beer in the serving tank.

The big difference between doing this in a brewpub and doing it at home is that most brewpubs filter the yeast from their beer and keep the beer very cold after filtration. This means that the brewers don't have to worry about

the sugars fermenting. Even if there is some yeast left after filtration, which often is the case, the beer is stored too cold for most ale-yeast strains to ferment. The last big difference is that the serving tanks have pressure-relief valves that will relieve excess pressure in the tank if a secondary fermentation unexpectedly kicks off.

If you use a fruit flavor with fermentable sugars at home, be careful! These flavors will create several dozen bottle bombs if you add them at bottling time.

As far as the usage rate, most of these products have a suggested range. If you stick to this range, you'll be okay. If you have an unfermentable fruit essence, you can make up a few test concentrations using a commercial porter and get a good idea of how the flavor will taste in your finished beer. When it's time for bottling, add your essence and bottle condition as usual.

Mr. Wizard

I have noticed that bleach is not the sanitizing solution of choice for most brewers. My water system is well and septic. What "environmentally friendly" sanitizing solution is friendly enough for my septic system?

*Dave Bieganski
Anchorage, Alaska*

There are many different sanitizers available to homebrewers. In your particular case you want a sanitizer to effectively kill bacteria and wild yeast that may spoil your beer. But you don't want to kill the bacteria, at least not too many of them, that make your septic system function.

I don't know the size of your septic system, but in all likelihood you could use just about any sanitizer available on the market to sanitize your homebrewing tools without harming the septic system. Since most sanitizers work by

chemical oxidation, they lose their sanitizing ability after they have done their oxidation dirty work. This is why using a sanitizer such as bleach on a dirty surface doesn't guarantee success; the dirty surface uses up the oxidizing potency of the sanitizer before the sanitizer kills the bugs. The amount of oxidizable matter in the drain line between your home and your septic tank will probably take care of most sanitizers that you might use.

Chemical cleaners are a different matter, especially those cleaners containing phosphates. Most states have laws regulating the types of soaps and detergents that are permissible for sale, and many soaps are especially designed for septic systems. Detergents are designed to wet surfaces and carry crud away from the surface. They include chelating agents that make them foam even in the hardest of waters. In the scheme of things, soap selection is much more important to

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your septic system than sanitizer selection.

Although I probably sound like a card-carrying sanitizer abuser, I don't like chemical sanitizers for a different set of reasons. The only way to really sanitize anything effectively is to apply the sanitizer as the last step of the cleaning process. Last means last and leaves no room for a water rinse — especially well water!

As an Alaskan you are probably much more aware of nature than most of your fellow Americans down south. Many people have the notion that water is somehow bacteria-free purity flowing freely from the taps of their homes. As nice as the concept sounds, tap water carries no guarantee of being free of bacteria. In most cases it probably doesn't carry the bacteria that spoil beer, but when it comes to cleaning procedures, "probably doesn't" translates to "may contain."

I don't like many of the sanitiz-

ers (such as bleach) commonly used by brewers because they affect the beer flavor and appearance when left on the surface of the item being sanitized. Some make the beer taste medicinal, and many ruin its foam. We use sanitizers to keep the beer free of bacteria, but if it ends up with a different problem, what's the point? Funky beer is funky beer.

The two non-rinse sanitizers I really like for sanitizing the big items, such as fermenters and hoses, are peroxyacetic acid and hot water.

Peroxyacetic acid is a fairly new sanitizer that has gained popularity with commercial brewers. It is a combination of hydrogen peroxide and acetic acid. The sanitizer is stable in the absence of oxidizable matter but breaks down into peroxide and acetic acid when exposed to organic debris. Assuming the item being sanitized is clean, the organic debris is probably some microbial bug and is rapidly killed by the very

aggressive peroxide component. The ultimate byproducts of peroxyacetic acid are water and acetic acid (vinegar). Spoiled beers often have high levels of acetic acid, but all beers contain a very small amount. Hence, peroxyacetic acid doesn't add anything foreign to beer.

The other sanitizer I really like is hot water. Nothing destroys microorganisms like heat, especially wet heat (dry heat, like an oven, is much less effective at killing bacteria than steam heat or hot water). Heat also destroys some brewing equipment, including plastic hoses and plastic fermenters. It also does a job on glass. However, if you have heat-resistant items that you wish to sanitize, you can't beat hot water. This is one sanitizer that doesn't care if the equipment has some dirt on it! The rule of thumb for killing beer-spoilage organisms with hot water is 20 minutes at 180° F or hotter. (Do this by heating a pot of water, not by cranking up your hot water heater to scalding temperatures.)

This is different than the time and temperature required for food products capable of supporting the growth of pathogenic bacteria, such as *Clostridium botulinum*, since many of these organisms produce heat-resistant spores. Lucky for us brewers, beer doesn't support the growth of pathogenic organisms.

(For more on sanitizers, see "Four Sanitizing Solutions," February '99 BYO.) ■

Mr. Wizard's Address

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

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

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CIRCLE 30 ON READER SERVICE CARD

Rediscover Two Old Favorites

by Mikoli Weaver

This month's styles feature two ales that are often missing from the average homebrewer's recipe book. The first is an authentic German dunkelweizen, often bypassed for the more popular hefe-weizen. The other is the classic English bitter, which is often replaced by IPA and pale ales.

If you haven't brewed these styles, consider this an opportunity. March, beginning the season of spring (hopefully), will also be the month of new brewing experience. And if you already enjoy brewing these beers, this is an opportunity to sharpen your skills a bit and perhaps try a new method or two. It's also time to bottle the Irish Stout brewed in February and the Year 2000 Barleywine brewed in January.

Break From the Mundane

Dunkelweizen is an often underrated beer style that offers much character and depth. Dunkelweizens historically have been mostly produced in the southern part of

Germany, although they now are made by breweries large and small almost everywhere.

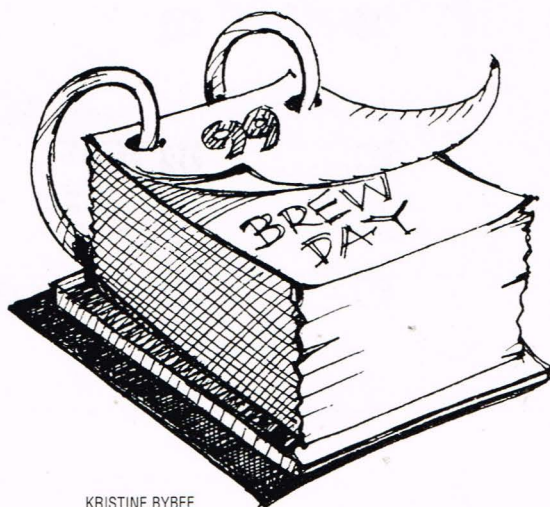
For homebrewers who are tired of hefe-weizen, this is an excellent opportunity to get to know wheat again as a brewing agent. Dunkelweizens are beers with depth. Like the pale Bavarian hefe-weizens they are rich and smooth with a nice clove character, but they are vastly more complex.

Despite their complexity they are fairly easy to brew, considering that they simply are variations of standard wheat-beer recipes. Except for color, the numbers and style parameters for dunkelweizens are almost identical to those of other weizens. Targets include: original gravity (OG) 1.048 to 1.056 (12° to 14° Plato); alcohol by volume (ABV) 4.8 percent to 5.4 percent; bitterness 10 to 15 IBU; color 16 to 23 SRM (amber to brown).

It should be emphasized, however, that dunkelweizen is not a weizen with dark grain thrown in it to make it dark. The flavor profile has to be thought out and malts chosen specifically. While there are some roasted and chocolate flavors emerging from the palate, caramel and roasted-wheat flavors should dominate the malty profile while also allowing the yeast and noble hop character to emerge. So it is important to formulate a good base.

Wheat and Other Malt

Dunkelweizens, like their lighter (in color) counterparts, should consist of up to 60 percent wheat malt. This particular style is good when the grain bill consists of about 60 percent wheat malts, with 20 percent to 30 percent of that dark wheat in the 5° to 10° Lovibond range and the remaining 30 percent



KRISTINE BYBEE

Defining a Few Terms

SRM (Standard Reference Method) and degrees **Lovibond** are two methods of describing color. The scales provide roughly the same number, but SRM uses a more sophisticated method and is more accurate. For example a light yellow beer is 2 SRM (or 2° Lovibond); amber is 13 SRM; brown is 22 SRM. Malt color ratings are typically expressed

in Lovibond.

IBU (International Bittering Units) is a measurement of hop bitterness in beer. For example a beer with 27 IBUs is mild. Very bitter is 42 IBUs.

Degrees **Plato** is a liquid-density scale that is also expressed as **specific gravity**, which is read on a hydrometer. A beer that is 12° plato is 1.048 specific gravity.

to 40 percent of the standard range of 2° to 4° Lovibond. Unfortunately, not all homebrew shops carry a darker variety of wheat.

This leads to using dark specialty grains. Small amounts of chocolate (300° to 400° Lovibond) and roasted barley or wheat (400° to 500° Lovibond) are good coupled with dark caramel malts.

Caramel malts can often lend greater depth to the beer as well as improve body and head retention. However, in this case the caramel addition to the beer is not empha-

sized. The flavors of the wheat and yeast must still show through in the finish. So for this beer darker caramel malts of 80° to 120° Lovibond would probably be the best. This way the color can be achieved with a much smaller addition of these highly kilned malts than would be necessary with a lighter caramel malt with a rating of 20° or 40° Lovibond. Thus the finished beer will have a lower caramel malt profile.

The creation of flavor balance is another reason brewers should be

careful about using caramel wheat products. Most run in the 40° to 80° Lovibond range for color. A fair amount must be used to achieve the desired color. The final grist bill would contain more than 60 percent wheat, throwing the beer out of balance. You will want the beer to be somewhat light and not overwhelming with wheat richness.

So if you choose to use a caramelized wheat product, make sure that your grain bill doesn't exceed 60 percent wheat (pale and caramel included). Moreover, a lighter grain is commonly used to achieve just this balance. Pale Munich and pilsner malts are excellent choices. And 20 percent to 30 percent wheat content is good, with the rest of the grain bill made of specialty malts.

Hops

Like any other wheat beer — or German beer in general — the choice of noble hops is significant. The low alpha content and fine aroma of these hops are perfect for the low bitterness profile desired. Hallertauer, Tettnanger, Saaz, and Hersbrucker are all common and

March 1999

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5 PREP DAY • Prep day for dunkelweizen • Assemble ingredients and make yeast starter	6
7 BREW DAY • Brew dunkelweizen • Prime and bottle Dublin stout	8	9	10	11	12	13
14 TRANSFER • Transfer dunkelweizen to secondary • Dublin stout ready to drink!	15	16	17	18	19 PREP DAY • Prep day for ESB • Assemble ingredients and make yeast starter	20
21 BREW DAY • Brew ESB • Prime and bottle dunkelweizen	22	23	24	25	26	27
28 TRANSFER • Transfer ESB • Prime and bottle barleywine • Dunkelweizen ready to drink!	29	30	31			

can be used in multipurpose roles when brewing this beer. For more bitterness in your dunkelweizen, choose a more useful bittering hop such as German Northern Brewer, Perle, Spalt, or Brewer's Gold.

Yeast Character

This style requires an authentic German wheat ale yeast. The clove, phenol, and spicy finish of a proper wheat yeast enhances the malty profile of this beer.

One of the greatest commercial yeasts is found at the bottom of a bottle of Spaten's Franziskaner hefeweizen or dunkelweizen. Culture this yeast with one pint of sterile wort, 1.028 specific gravity (7° Plato), two days before brewing. In lieu of the Franziskaner, Wyeast 3056 (Bavarian wheat) and 3068 (Weihenstephan weizen) are both very good.

This flavor is evident in all dunkelweizens from abroad. In addition to the two Spaten Franziskaner weizens, Haaker Pschorr Dunkelweizen and Ayinger Ur-Weiss are good examples. All are brewed with the same phenolic yeasts used to create the other wheat beers in their respective product lines.

ESB — Bitter Semantics

ESB is an interesting style to consider because the term "bitter" is so subjective. How you interpret it depends on where you live and drink. In the United Kingdom bitter is commonly thought of as the draft version of a pale ale, while in the United States bitters are entirely different.

For our purposes they will be considered different styles of beer, with examples of classic English and modern U.S. styles listed specifically.

The general category of bitter can be broken into three main subdivisions:

1. Ordinary bitter. OG 1.032 to 1.038 (8° to 9.5° Plato); ABV 3 percent to 3.7 percent; bitterness 20 to 35 IBU; color 8 to 12 SRM.

2. Special or best bitter. OG 1.038 to 1.044 (9.5° to 11° Plato); ABV 4.1 percent to 4.8 percent; bitterness 28 to 46 IBU; color 12 to 14 SRM.

3. Strong or extra special bitter. OG 1.044 to 1.060 (11.5° to 15° Plato); ABV 4.8 percent to 5.8 percent; IBU 30 to 55; color 12 to 14 SRM.

With each subsequent style the hop character, bitterness, malty

flavor, body, and richness increase. In special and extra special bitters some diacetyl and fruity fermentation flavors (ester) also may be present but in low amounts. Some ordinary and special bitters worth trying are Shepherd Neame's

Brew Schedule Notes

March 5, Friday:

Prep day for dunkelweizen

- Make one pint yeast starter for dunkelweizen, grow until Sunday.
- Assemble recipe ingredients for dunkelweizen.
- Soak equipment in sanitizer.

March 7, Sunday:

Brewing/Racking

- Brew dunkelweizen.
- Primary fermentation starts. Check original gravity and record.
- Sanitize and rinse bottles.
- Rack Dublin stout to bottling vessel.
- Check and record final gravity.
- Prime and bottle Dublin stout.
- Age one week before drinking.

March 14, Sunday:

Transfer dunkelweizen

- Rack dunkelweizen to secondary.
- Check gravity and flavor for progress.
- Continue fermenting for one more week.
- Dublin stout ready to drink.

March 19, Friday:

Prep day for ESB

- Make 1 pint of yeast starter and grow until Sunday.
- Assemble ingredients for ESB recipe.
- Soak equipment in sanitizer.

March 21, Sunday:

Brewing/Racking

- Brew ESB.
- Primary fermentation starts. Check original gravity and record.
- Sanitize and rinse bottles.
- Rack dunkelweizen to bottling vessel.
- Check and record final gravity.
- Prime and bottle.
- Start conditioning for one week (March 28), date, and reserve one case for the cellar.

March 28, Sunday:

Transfer ESB/Rack barleywine

- Rack ESB to secondary.
- Check gravity progress and flavor.
- Continue fermenting for six days (rack to secondary on Saturday, April 3, or Sunday, April 4).
- Sanitize and rinse bottles.
- Rack barleywine to bottling vessel.
- Check and record final gravity.
- Prime and bottle.
- Age until New Year's Eve 2000. Check bottles every few months to make sure that all is well with flavor and carbonation.
- Dunkelweizen ready to drink.

April brews: Maibock and Belgian Golden. Yes!

1999 Style Calendar

January Barleywine, Imperial Stout

A cold winter month with two powerful, warming beers. The barleywine will be aged for drinking on New Year's Day 2000. Coming off of December's highly hopped Christmas beers, this really starts off the year with a bang.

February Steam Beer, Dublin Stout

A refreshing steam beer to break up the dark season and a classic Dublin stout to drink in March for St. Pat's day.

March Dunkelweizen, ESB

Two nice beers to begin the early spring. Full of flavor and fun to drink.

April Maibock, Belgian Golden

Starts off with a seasonal maibock, lagered to drink in May, and a nice Trappist ale such as Orval.

May Amber Ale, Pale Ale

Two solid styles, an amber ale and a good American-style pale ale, to add some more hops to the spring season.

June Pilsner, Nut Brown Ale

A pils to start the summer and a nut brown to add a little variety to the summer season.

July IPA, Belgian Tripel

IPA is a summer must, followed by a powerful Belgian tripel to mix it up a bit.

August Witbier, Kölsch

Something for everybody, here are two light beers to fight the heat of the dog days of August.

September Oktoberfest, Hefe-weizen

An Oktoberfest to be lagered for drinking in October and a traditional Bavarian hefe-weizen to usher in the fall.

October Doppelbock, Scottish Ale

A big doppelbock and a Scottish ale to warm us as the nights cool and the leaves fall.

November Porter, Frambozenbier

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

December Christmas Ale, Old Ale

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

Bishop's Finger, Mackeson Ale, and Young's Special Bitter or Ram Rod Ale.

ESB, the most common of the three styles, is predominately marked by caramel, English yeast character, and hop aroma. Traces of roasted grains, earthiness, and biscuit should emerge as well, melding with fruits and moderate alcohol levels. They should finish clean and fairly crisp and dry, but linger with malt and hop character.

Some imported examples of ESB are the famed Fuller's ESB, Young's ESB, Shepherd Neame's Master Brew, Bateman's XXXB, and Hardy's Country Bitter. All are essentially English pale ales to the eye and palate, even though many breweries now produce both styles.

In the United States ESB has become a widely proliferated style as well, much to the credit of Redhook and original brewer Bucky Buchanan, who introduced Redhook ESB in the early '80s. Since then many micros have followed in their footsteps, with beers including Full Sail Equinox ESB, Pyramid ESB, Great Lakes ESB (the old Moon Dog recipe), Goose Island Honker's Ale, and Steelhead Nigel's ESB among hundreds of others.

The differences among these beers are quite marked, and there's an even greater distinction between the U.S. and U.K. versions. But as a whole, when viewed as being separate from pale ale, ESB is darker, more caramely, more malty, and less hoppy. U.S. examples are almost always more hoppy than U.K. beers.

All good ESBs do have one thing in common: an English strain of ale yeast. If you cannot find a live bottled culture (which is hard because almost all English ESBs are pasteurized), Wyeast 1968 (London ESB), 1028 (London ale), 1318 (London ale III), 1098 (British ale), and 1275 (Thames Valley) are all good. Or try White Labs' WLP002 (English ale), which is very flocculent. The recipes here call for Wyeast 1968 or 1318 because of the flocculation characteristics, but if clear beer is not an issue with you, the options are open.

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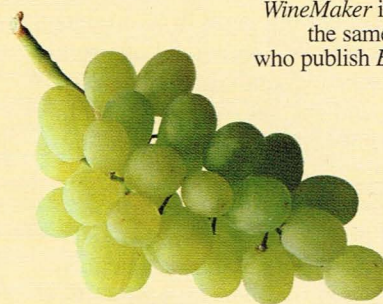
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Hops

A wide variety of English hops can be used for brewing bitters. Bittering hops may include Bullion, Bramling Cross, WGV (Whitbread Golding Variety), Progress, Challenger, Northdown, and Target. The recipe provided here for ESB was a silver medal winner in the World Beer Championships. It uses Northern Brewer as the bittering hop. You might choose an English bittering hop (such as any of those listed above) instead, but it is not mandatory here.

Aroma and flavoring hops (and somewhat dual-purpose hops) include Fuggle, East Kent Goldings, and Bramling Cross. To create a more Americanized model, use Centennial, Chinook, Columbus, Eroica, or Galena as bittering hops and Cascade, Mt. Hood, Liberty, Willamette, or Crystal for aroma and flavoring varieties.

Mashing for Aroma and Flavor

Creating the grain bill for a good ESB, like a good pale or amber, takes some understanding. First, the profile should be much more malty than a typical pale ale and able to balance the hops to create a smoother drinking ale. Second, the beer should have some roasted character to complement the caramel, somewhat like an American amber and a nut brown combined. To accomplish this the brewer needs to have an ample amount of caramel and brown malts in the grain bill. Some good places to start are brown malt, pale chocolate, biscuit, and special roast mixed with a nice range of crystal 20° Lovibond and crystal 60° Lovibond.

Some brewers avoid darker roasted grains such as roasted barley, black patent, and dark chocolate as a way of differentiating ESBs from ambers. Ambers are almost always given some highly roasted grain to offset the red/yellow color balance, creating a deeper red rather than a copper color. Remember, ESB is a pale ale of sorts; few have roasted barley in them.

The recipe here calls for Belgian biscuit, a very aromatic, bready brown malt from De Wolf-Cosyns,

and pale chocolate, an aromatic and very earthy malt from Beeston. If you can't find these grains, ask your local homebrew shop to match them as closely as possible, particularly in the aroma and flavor profiles. Color should not be a significant issue. The biscuit is 25° Lovibond, and the pale chocolate is about 170° Lovibond.

Dunkelweizen (5 gallons, all-grain)

Ingredients:

- 6 lbs. wheat malt
- 2.5 lbs. Munich pale malt
- 0.5 lb. carapils or dextrin-type malt
- 0.75 lb. crystal malt, 120° Lovibond
- 0.125 lb. roasted barley
- 0.25 oz. Perle hops (7.3% alpha acid) for 90 min.
- 0.5 oz. Hallertauer hops (3.5% alpha acid): 0.25 oz. for 30 min., 0.25 oz. at end of boil
- 1 pt. starter of Wyeast 3056 (Bavarian wheat)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 3 gal. of water at 150° F for 60 min. Sparge with 168° to 170° F water to collect 5.75 gal. of wort.

Total boil is 90 min. At beginning of boil, add Perle hops and boil 60 min. Add 0.25 oz. of Hallertauer, and boil for 30 min. more. At end of boil, add the remaining Hallertauer. Whirlpool and cool to 69° F to pitch starter. Oxygenate/aerate well.

Ferment for seven days, then rack to secondary fermenter. Continue for seven more days or until fermentation is done or gravity is about 1.012 (3° Plato). Prime and bottle. Allow to carbonate and age at least seven more days before drinking.

OG = 1.056 (14° Plato)
16 IBUs
SRM: 23

Dunkelweizen (5 gallons, extract with grain)

Ingredients:

- 7.5 lbs. malt extract syrup (blend

of 70% wheat malt and 30% pale malt)

- 0.5 lbs. Munich pale malt
- 0.5 lb. carapils or dextrin-type malt
- 0.75 lb. crystal malt, 120° Lovibond
- 0.125 lb. roasted barley
- 0.25 oz. Perle hops (7.3% alpha acid) for 60 min.
- 0.75 oz. Hallertauer hops (3.5% alpha acid): 0.5 oz. for 30 min., 0.25 oz. at end of boil
- 1 pt. starter of Wyeast 3056 (Bavarian wheat)
- 2/3 cup corn sugar for priming

Step by Step:

Start with 5 gal. of 150° F water. Steep crushed grain for 30 min. Sparge grains with enough 170° F water to make 5.5 gal.

Heat to boiling and add extract syrup. Total boil is 60 min. At beginning of boil, add Perle. Continue boil for 30 min. and add the 0.5 oz. Hallertauer. Boil for 30 min. more, add remaining Hallertauer, and whirlpool. Cool to 69° F and pitch starter. Oxygenate/aerate well.

Ferment for seven days, then rack to secondary fermenter and continue for seven more or until fermentation is done or gravity is about 1.012 (3° Plato). Prime and bottle. Allow to carbonate and age at least seven more days before drinking.

OG = 1.056 (14° Plato)
16 IBUs
SRM: 23

ESB (5 gallons, all-grain)

Ingredients:

- 5.5 lbs. Maris Otter malt
- 2.5 lbs. Gambrinus ESB or two-row pale malt
- 1 lb. carapils or dextrin-type malt
- 1 lb. crystal malt, 20° Lovibond
- 0.5 lb. crystal malt, 60° Lovibond
- 0.25 lb. pale chocolate malt
- 0.5 lb. Belgian biscuit malt
- 0.5 oz. Northern Brewer hops (8.5% alpha acid) for 90 min.
- 1 oz. Fuggle hops (4.2% alpha acid) for 45 min.
- 1 oz. East Kent Golding hops

(5.4% alpha acid): 0.75 oz. for 15 min., 0.25 oz. for dry hopping during secondary

- 1 pt. starter of Wyeast 1968 (London ESB)
- 2/3 cup priming sugar

Step by Step:

Mash grain in 3.5 gal. of water at 150° F for 60 min. Sparge with 168° to 170° F water to collect 5.75 gal. of wort.

Total boil time is 90 min. At beginning of boil add Northern Brewer and boil 45 min. Add Fuggles and boil 30 min. more. Add the 0.75 oz. Goldings and boil remaining 15 min. Whirlpool and cool to 69° F to pitch starter. Oxygenate/aerate well.

Ferment for seven days, then rack to secondary fermenter. Dry hop with remaining Goldings and continue for seven more or until fermentation is done or gravity is about 1.012 (3° Plato). Prime and bottle. Allow to carbonate and age at least seven more days before drinking.

OG = 1.060 (15° Plato)

42 IBUs

SRM = 17

ESB

(5 gallons, extract with grain)

Ingredients:

- 8 lbs. English pale malt syrup
- 1 lb. carapils or dextrin-type malt
- 1 lb. crystal malt, 20° Lovibond
- 0.5 lb. crystal malt, 60° Lovibond
- 0.25 lb. pale chocolate malt
- 0.5 lb. Belgian biscuit malt
- 0.75 oz. Northern Brewer hops (8.5% alpha acid) for 60 min.
- 1 oz. Fuggle hops (4.2% alpha acid) for 45 min.
- 1 oz. East Kent Goldings hops (5.4% alpha acid): 0.75 oz. for 15 min., 0.25 oz. for dry hopping during secondary
- 1 pt. starter of Wyeast 1968 (London ESB)
- 2/3 cup priming sugar

Step by Step:

Start with 5 gal. of 150° F water. Steep grain for 30 min. Sparge grains with enough 170° F water to

make 5.5 gal.

Heat to boiling and add extract syrup. Total boil is 60 min. At beginning of boil add Northern Brewer. Boil for 15 min. and add the Fuggles. Boil for 30 more min., add the 0.75 oz. Goldings, and finish last 15 min. of boil. Whirlpool. Cool to 69° F and pitch starter. Oxygenate/aerate well.

Ferment for seven days, then

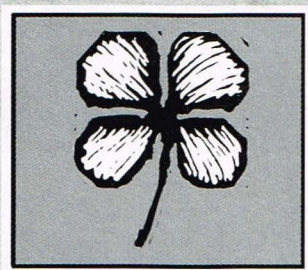
rack to secondary fermenter, dry hop with remaining Goldings, and continue for seven more or until fermentation is done or gravity is about 1.012 (3° Plato). Prime and bottle. Allow to carbonate and age at least seven more days before drinking.

OG = 1.060 (15° Plato)

42 IBUs

SRM = 17 ■

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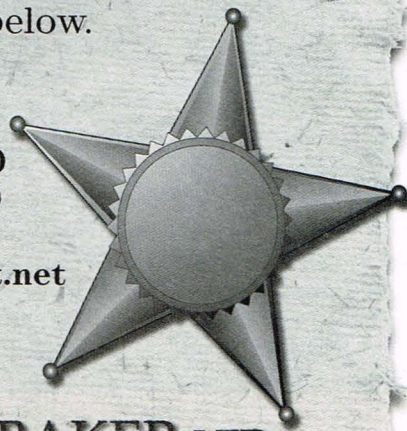
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It's a rare advanced homebrewer who has not invested in a kegging system. Many dedicated brewers with a few years of experience have the full array: some pristine new soda kegs, some dented beaters that they got cheap, a regulator, a CO₂ tank, a basement fridge with a tap in the door, and thousands of poppets, o-rings, relief valves, y-splitters, and tricky tap handles. Extreme cases even build semi-automated CIP (clean in place) systems that circulate caustic cleanser and sanitizer via a pump.

Now, draft beer is good beer. Kegging systems offer many advantages: less cleanup per batch, the ability to filter beer effectively, quick forced carbonation, and counter-pressure bottling to mention only some. The very best parties, too, involve draft beer. But there are fools/geniuses out there who take a great deal of pride in brewing large batches frequently, and who bottle every droplet.

Bottled homebrew is rewarding in different ways, both at filling time and at emptying time: different bottle formats, bottle conditioning, super-long aging, and portability. No beer gift personalizes brewing better than an elixir-filled thick brown



TODD HAMMOND PHOTOS

by Craig Hartinger

Bottling your pride and joy can be



as fun as brewing it once you master these eight easy steps.

A little planning and a few pointers can make the packaging process fun.

bottle with a custom label. After any Y2K or other millennium-inspired apocalypses, bottling will allow the brewer to package beer un beholden to CO₂ bandits or hardware suppliers. And crown caps cost less than two cents each, so everybody should go get a few dozen gross now.

A little planning and a few tricks can make the filling part of brewing rewarding — maybe even fun — and there is nothing like a bottled inventory of 10 or more different batches, with different bottle formats and labels.

Eight Steps to Packaging Beer

The classic method of putting “sparkle” into a beverage is to seal it in a vessel and capture CO₂ produced by the yeast. If the CO₂ can't escape, it will become dissolved into the beverage. Homebrewers accomplish this by allowing the yeast to complete fermentation, then providing a measured amount of new food that will restart CO₂ production. By bottling and capping immediately, then waiting a few days, the brewer uses yeast to produce carbonated, or “bottle conditioned,” beer.

Bottling, more than any part of homebrewing, gets easier and more fun as the brewer's routine becomes more effective. Here's the procedure:

1. Allow the beer to ferment to completion. The time to bottle is when the yeast has consumed all available food and is yawning, heading to its dormant stage. Brewers know when this stage has arrived either by taking consecutive gravity readings and waiting until the gravity has stopped dropping, or by looking: If the airlock activity has slowed to where you *really* have to look to see activity and the beer has fallen clear, the beer is probably ready. (Glass fermenters do offer the advantage of allowing the beer to be seen.)

Use a stick-on liquid crystal thermometer on every fermenter, and get to know one or two of your favorite yeast strains intimately. Then you and the yeast will know by subliminal communication the exact hour the beer is at its best for bottling.

If your fermenter is down on the ground, you must lift it up onto a counter or table from which to siphon. Why didn't you think of that yesterday, so the sediment you stirred while lifting it would have time to resettle?

2. Sanitize your bottles. Before sanitizing, the bottles must be clean. If you get bottles from friends, your best bet before the first use is to give them a hot, soapy wash and use a bottle brush to get out any dried beer residue. It is worth it to be extremely fastidious (downright nitpicky) at this time with the bottle brush. Get the dried deposits off so that in future uses the cleaning routine will be simple; you'll rinse each bottle at least twice immediately after emptying.

After the initial hot, soapy wash and thorough rinse, the bottles will be ready to go into your sanitizer bath, but there is no such thing as a quick, thorough rinse unless you have a bottle washer. This sawbuck-priced check valve screws onto your sink spigot and directs the stream upward into the bottle, blasting the bottle with rinse water. When you lift the bottle off the washer, the check valve stops the flow. You grab a bottle in each hand, and work on speed. Bottlers who rinse after the sanitizing step use their bottle washers then, too.

Sanitizing solution can be chlorine bleach and water (1.25 ounces of bleach, about 2 tablespoons, is enough for five gallons of water); iodophor, an iodine-based food-service industry sanitizer; or one of the commercial brewery no-rinse sanitizers that are now sold in homebrewer-sized packages. A five- to seven-gallon plastic bucket makes an excellent vessel for sanitizing. Fill it up with solution, plunge the bottles under the surface, and hold them under until they fill enough to sink.

Time is important for sanitizers to kill microbes, so don't push the minimums and wonder if 15 minutes of exposure is enough. Do it before dinner or even the day before. When the bottles come out of the sanitizer, your drying rack will hold them upside down so any liquid runs out

and airborne microbes are least likely to float in. A homemade drying rack, made from plywood with a hole saw, is superior to a store-bought rack that has little, easily contaminated prongs that stick up into your bottle. Two key hints: You must rinse if you use a bleach sanitizer. Don't mix no-rinse iodophor sanitizer stronger than the label recommendation, or your beer will taste like blood.

3. Position the bottles for filling. If you place the bottles in racks at this point, you will be ready to fill immediately after you rack to your priming vessel. Line up the bottles on the floor, and leave enough room between racks so you can just move down the line with your wing capper. If you use a bench capper, place the empties for ease of filling and allow plenty of room to put the fulls.

Some brewers cover the bottles with foil that has been sanitized by steam or by a solution as they prepare the priming vessel.

4. Prepare a priming solution. What to use? How much? The answer is trial and error, and many brewers have done the trial and error. For a good median level of bubbles, use three-quarters cup of dextrose (corn sugar) — or five ounces; weighing is more accurate — for a five-gallon batch. For some highly carbonated styles, or if you prefer a higher level of carbonation, use more; for lower carbonation levels or for short batches, use less. Energized brewers will split batches into different bottling vessels and try different levels of primings or different sugars. A few suggestions for five gallons: 1¹/₄ cup of dry malt extract; seven-eighths cup of molasses; two-fifths cup of honey.

The procedure is to add the primings to a small volume of boiling water (two to three cups) and boil for at least 10 minutes, sterilizing the solution. If you use a glass carboy as a priming vessel, cool the solution before adding it to the vessel. That way you'll avoid beer-soaked broken-glass shards.

5. Rack (transfer) the finished beer onto primings. Finished beer

left on a cake of settled yeast will sooner or later develop an off-flavor, because the dormant yeast will break down. Either rack the beer by siphon to another fermenting vessel for storage or rack it into a bottling vessel (to which you have added the priming solution).

The easy way to start a siphon is to sanitize the rigid cane and flexible hose combination, fill it with water, then authoritatively invert and plunge the cane into the finished beer. But first get rid of that plastic cap on the end of the racking cane that is supposed to keep the intake above the sediment.

It's not like every layer at the bottom of the fermenter is always the same height, and the little cap just makes it harder to start the siphon. Keep your washed thumb over the open end of the hose to help keep the water in the hose. Don't panic and race, but if you move too slowly the liquid will begin to drain out.

Practice this one with plain water before you move on to your precious beer. The vessel from which you are siphoning must have its bottom higher than the top of the vessel to which you are siphoning.

Put the priming solution in the bottling bucket or carboy first, because then it will be easier to get the solution mixed throughout the beer. At no time should finished beer be aerated or agitated. Air at this point will eventually lead to oxidized flavors (wet cardboard or bad sherry) and will severely reduce the shelf life of the beer. Always rack gently, and don't stir your beer aggressively to mix in the primings.

A couple of other suggestions may help with the racking process. First, rack from a glass fermenter and watch the end of your racking cane through the carboy. You will be able to hold the end of the cane just above the layer of yeast sediment and avoid getting too much dormant yeast and coagulated protein (trub) into your bottling vessel, and you'll do it easily because you took off the cane tip. Don't worry that you are not getting enough yeast into the priming vessel; there

is enough suspended in the beer for conditioning, even though it looks like it all settled.

If your beer is too dark to see the end of the cane, you can put a mark an inch from the bottom of the cane. By watching the mark at the top surface of the beer, you will be able to keep the tip under the surface as the level drops without drawing out too much sediment.

If you place the outflow end of the hose so it follows the curve at the bottom of your bottling bucket, the beer will gently swirl in and mix the primings without aerating.

A bottling tip that could save a batch of your beer: Develop habits that help prevent possible contaminations. Put the cat out, so it doesn't domino your ranked bottles. Let your answering machine pick up

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instead of pausing to put down a siphon hose. Learn to hold your head to the side, not directly over your priming bucket, as you transfer — that way if your Copenhagen falls out of your mouth, it will land on the floor instead of in your beer. (Yes, to a friend; yes, he bottled it anyway; yes, it was foul, contaminated, and undrinkable.)

5b. Or use tablets. If you want to avoid preparing a priming solution and racking onto the primings, tablets of dextrose are available now and they perform well. The brewer drops tablets into sanitized bottles, then racks right from the fermenter to the bottles. You do lose the benefit of having a second settling chamber after the fermenter, but the tablets certainly reduce risks of oxidation by eliminating one transfer and eliminating bucket time.

6. Fill the bottles. After lifting the priming vessel up to a height above the bottles, refill the cane-and-hose combo with water (after re-sanitizing if you like, but hurry because the beer is now in a bucket and it is exposed to the atmosphere) and plunge the rigid cane into the bottling vessel. The outflow end of the hose produces only water first, so drain that into a bowl before moving to the first bottle.

By putting a crimp in the bottling hose, you can cut down on

potential oxidation and really control bottle fill levels. Cut off the flow by crimping the hose, run the end of the tubing down to the bottom of the bottle, and smoothly uncrimp. The flow will begin and you can lift the hose to follow the level up as the bottle fills. Crimp again when the bottle is full, and move to the next one. Raising the hose to follow the fill level means there is no drop in the level when you finally remove the hose.

How full is correct? A half-inch of headspace is on the too-full side; and 1½ inches is probably too much headspace. Three-quarters to one inch will allow natural carbonation while reducing oxidation risk from the air left in the headspace. Filling a bottle too full will slow or impair the bottle-conditioning process.

Fill your large-format bottles first because they take longer to fill per bottle and will allow you to get smooth and efficient by the time you get to the small bottles. The pace is fast when filling seven-ounce nip bottles! By filling the small bottles last you also will reduce the chance of wasting beer, because your priming bucket will run dry eventually and you would much rather waste half of a seven-ounce bottle than half of a 22-ouncer.

7. Cap the bottles. If you used swing-top bottles, swing up and lock down the cap. The standard crown

cap must be sanitized, either by heat or by a sanitizing solution. (Chlorine solution is not ideal for metal — crowns or the metal bail on a swing top will pit or rust in a chlorine solution, although it can be used for metal if monitored closely.) Some brewers claim that boiling crowns reduces the integrity of the plastic seal so they only use iodophor; others boil for 10 minutes every time with no problem.

Place a sanitized cap on each bottle — when you get really good you can keep up with the bottles as you fill. First pour off the sanitizer or water. Grab a crown by the edges as the next bottle fills, popping it on. Finish all fills and let the caps sit on the bottles for a few minutes before capping, because you have knocked some CO₂ out of solution and it will drive some of the air out of the headspace, reducing oxidation risk. Remember that with a wing capper or a bench capper, once you move the handle or handles all the way down the cap is on. There is no point in backing off and operating the levers a second time.

Crowns that have an oxygen-absorbing liner are available for an extra cost. The liner helps prevent air from entering the bottle through the crimp in the cap over a long period. Research indicates these caps don't do much to reduce oxidation that develops within the bottle, however.

8. Store the bottles during conditioning. Remember that you are using yeast to produce carbonation, so don't put the newly capped bottles in a place that is too cold for the yeast. Storing your brewing thermometer with the conditioning beer will tell you how you are doing. Conditioning can be slow, depending on the yeast strain, gravity, temperature, and sometimes undetermined factors. Open your low fills first, and keep notes so you will know more with each batch.

Bottles, Labels, and Serving

Twist-top bottles can be capped effectively, but there is no good reason to use them if you have a choice. They are usually thinner

glass, and home cappers will fail to seat the cap properly on twists one or two percent of the time. (Plus, you want a chance to use your collection of tricky openers or your heirloom pocketknife from your homebrewing grandfather.) Home bottlers can expect a truly insignificant failure rate with non-twist tops — maybe one in 500 bottles.

If you are using an unfamiliar recipe or yeast strain, using one clear bottle per batch will allow you to check color as well as clarity during the conditioning period. Yes, clear glass doesn't protect the beer from light, and light can produce off-flavors. You, however, will not be storing this beer in the sun or under bright lights.

If you have recycled bottles that still have a factory label on them, you can use a simple soak in water to remove labels. Long soak times make it easy, although foil labels are somewhat waterproof and might need to be scraped with the back end of a knife to come clean. After you have amassed a bottle inventory, this task will become uncommon.

Consider using appropriate bottles for beer styles. Hefe-weizens and Märzens are all the more beautiful in the slender 16.9-ounce (0.5 liter) German bottle. The little 11.2-ounce Belgian shouldered bottles are never better than filled with your homebrewed Belgian styles.

Plain case boxes are another great enhancement to bottled beer. Small breweries and homebrew shops often have them; you don't want commercial boxes that have somebody else's logo! Beef up the case boxes with strapping tape because you'll use them over and over. A nice touch: Have your kids decorate them with drawings of bottles.

Your labels — which should be attached with plain old milk as an adhesive, whole or 2 percent, so you can get them off later for the next batch — are mercifully free of any need for government warnings or approvals. (Your state would probably never approve a commercial beer called "Brain Thrasher," for

example.) Make the art as unique as you dare. You don't even need a computer; you could use a potato stamp! Remember to throw one label in your brewing journal so you can look at it in 10 years.

Then, seat your friends in comfy chairs, pour the beer gently so that the sediment is left behind, hand them the glass and the empty bottle so they can check out the label.

(And don't expect non-brewing friends to remember to rinse the bottles; you'll do that part.) As they take a big pull and smile, you'll notice that they wouldn't be smiling if you had dropped a full five-gallon corny keg in their lap. ☺

Craig Hartinger brews in Seattle and really does bottle every droplet he brews.

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20 Facts You Should Know About Brewing

No single magic trick will transform good homebrew into great homebrew. Many brewers make excellent beer by following instructions and paying close attention to details. But brewers who understand the “why” of a particular process or operation in addition to the “how” seem to get the best results. Here are some brewing facts, including the whys, to keep in mind the next time you brew.

1. Simple is better.

In recent years homebrewing has continued to increase in sophistication. Many of the innovations enjoyed by homebrewers today are based on scaled-down equipment or operations used at the micro- or macrobrewing level. Interestingly enough, while homebrewers are now working with pumps, stainless steel mash screens, and the latest techniques for hop additions, commercial brewers are researching and developing ways to simplify and ease the brewing process. This is because the single biggest variable in the brewing process is not the ingredients or the equipment used but the one factor that many brewers overlook: the

human element.

It is an experiment that has been repeated many times: If you give 10 different brewers the identical ingredients and instructions, you will undoubtedly end up with 10 different finished beers. Remember that anything that can be done to organize the brewing process and keep it simple will not only make it an easier and more enjoyable hobby, it will reduce the likelihood of brewing errors occurring as well.

2. If it's not clean, it's not sanitary.

Cleaning is one area in which homebrewers, in mimicking their craft brewing and microbrewing cousins, often miss the point. While there is a multitude of chemicals and products available to help clean dirty equipment, many of the chemicals used in commercial operations are simply industrial substitutes for the one piece of equipment that no homebrewer can overuse — elbow grease.

Giant tanks that can't be reached can only be effectively cleaned with harsh chemicals, but there is really no good reason to employ hazardous caustics and

by John Oliver



Bud Peen

acids in homebrewing.

While good cleaners can help with the job, the best approaches to cleaning boil down to plenty of hot water and liberal use of scrubbing pads and brushes. Getting equipment spotless allows the chemicals used in the sanitization process to effectively do their jobs. Failure to get equipment clean can result in bacterial contaminations, and nobody enjoys dumping a spoiled homebrew down the drain.

3. Directions are there for a reason.

As with cleaning products, there are many choices today on what to use as a final sanitizer in homebrewing. Regardless of the sanitizer used, there is a human tendency to believe that if a little is good, more is better and *way* too much is just right. This seems especially true if a recent batch of beer has gone bad due to poor sanitization.

Unfortunately, failure to follow proper dilution instructions by creating stronger-than-recommended solutions usually results in a decrease in sanitizer efficiency. Furthermore, overmixing of sanitizers can result in residues that can create off-flavors even worse than those caused by bacterial contamination.

Remember to allow adequate contact time for the sanitizer to do its work. Mixing up sanitizing solutions that are double the recommended dosage does not mean you can cut the required contact time in half. Use the proper dilution ratios for the recommended time; your beer won't end up tasting like industrial paint stripper.

4. It's the water.

The vast majority of a bottle of beer is made up of the one ingredient that most brewers pay the least amount of attention to — water. Most of the truly successful mega- and regional breweries in the world today are located at or near a good source of clean water.

If your local tap water tastes good, without excess chlorine compounds or mineral imbalances, it will probably make good beer. Otherwise, most bottled drinking water will provide a good neutral source of clean water.

Water picks up its character as a result of what it passes through, so unless you are fond of unusual rubbery smells in your beer, think twice before filling the brewpot from the old garden hose hanging up in the garage. Draw your water directly from the tap or with a short length of food-grade hose such as the siphon hose available at most homebrew shops.

5. Water adjustments often create trouble.

There is a plethora of information regarding ways to adjust mineral content and pH levels of water to mimic the great brewing waters around the world. But use caution. Many times the levels of adjustment required as well as the minerals or acids used are relatively minor and difficult to accurately weigh without a gram scale, pH meter, and titration equipment.

In addition while government-mandated water reports for your local water supply are readily available and quite accurate (just call your local water department), many times these reports are annual averages, and the actual water could be quite different depending on the season and any recent rainfall if the water is from a surface source. Unless you feel that there is a substantial improvement to be made in beer quality due to the style of beer being made or the water available, avoid making too many adjustments to the brewing water.

6. Freshness counts.

You know that fresh beer tastes best, so keep that in mind when you purchase the ingredients for your next batch of beer. The same reactions that can result in beer going

stale over time can affect the ingredients as well, and using stale or out-of-date ingredients means you'll get stale off-flavors in the beer before it is even a few weeks old.

Beyond looking for obvious signs such as freshness dates, look at products before you buy. Do they look and smell fresh? Do the products appear to rotate frequently, or are the packages covered with dust? Are the hops green and kept cold in airtight packaging? Are packages of yeast stored in a cooler, or are they taped to the outside of a can of malt extract? If possible, taste grains to make sure there are no stale or moldy flavors or characters.

7. Milling grain can contaminate the brewing area.

Grain is a food source. As such it is literally covered with different types of bacteria, with *Lactobacillus* being the most common. In the brewing process this bacteria usually does not present a problem thanks to the high temperatures used in the mashing and boiling stages. If allowed to come into contact with cooled wort, *Lactobacillus* produces lactic acid in the finished beer. This creates sour, unpleasant off-flavors.

Milling grain usually creates a lot of dust, which in addition to being an irritant and nuisance also releases an airborne invasion of *Lactobacillus* into the surrounding environment. Most successful breweries move pre-mash grain processing as far away from the brewing and fermentation areas as possible, and homebrewers should do likewise. If you pre-mill your grain and need to transport it home, do so in a bag or old, unused pail, not a fermentation bucket.

8. Mash temperatures dramatically affect beer flavors.

In all-grain beer, conversion of starches into fermentable and unfermentable sugars takes place over a wide temperature band from 145° to 165° F. However, within this range

different enzymes are working at different temperatures. The work done by these enzymes has a big impact on the flavor profile of the finished product.

Beta-amylase, the enzyme responsible for creating easily fermented simple sugars, works best on the lower end of this range. Alpha-amylase, the enzyme responsible for breaking down starches into unfermentable long-chain sugars, works best at the higher temperatures.

Adjusting mash temperatures within this range gives you control over the finished wort. It can be very fermentable, resulting in a dry beer, or very dextrinous with a sweet, malty character. A good compromise allowing both enzymes to work relatively well is in the center of this range, 150° to 155° F.

9. Grains should be sparged at 168° F and 170° F.

The mashing process creates a sweet, sugary solution that must be lautered, or extracted to the brewpot. The sugars present in the mash react to temperature much the same way the sugars in a can of malt extract syrup do. When cold they become very thick and viscous, and when hot they tend to lose viscosity and flow more easily.

Extract brewers many times will run a package of malt syrup under the hot water faucet for a few minutes to make it easier to pour into the brewpot. For all-grain brewers the goal in sparging is to use the hottest temperature possible to take advantage of this effect and improve extraction efficiency, yet not extract any of the harsh, astringent tannins that are present in the husks of grain. This occurs best at 168° to 170° F.

10. There is no substitute for a hard, rolling boil.

There are many good reasons to employ a solid, rolling boil for a minimum of 30 minutes. A strong

boil ensures sanitization by killing any bacteria present. Compounds in hops responsible for bittering are isomerized and drawn into the final solution. And a strong boil is crucial in creating an effective "hot break," in which proteins that might otherwise cloud up or haze the finished beer are coagulated into particles that can easily drop out of suspension.

The steam that escapes from a vigorous boil carries with it several volatile aromatic compounds that can create unpleasant sulfury aromas in the finished beer — if they are not driven off.

11. Good notes make better beer.

Keep track of the temperature when you pitched yeast, the gravity of the wort before fermentation, mash variables, and many other tangible factors in your process. You can't know where you are going unless you know where you've been.

Without good notes, the many factors that can affect the outcome of a batch of beer will become muddled and forgotten over time and a few batches of homebrew. Being able to look back and review notes made at an earlier time can help you make decisions that change or improve the next flavor in that next batch, especially if you stumble across something unexpected but good. Using simple instruments such as thermometers and hydrometers allows you to take accurate readings that not only indicate what to expect from your current beer but that will help you to accurately reproduce it in the future as well.

12. Quick wort chilling does more than just save time.

After boiling, quickly dropping the temperature of the fresh wort to yeast-pitching temperature of no more than 70° F speeds up the entire brewing process. More important, it helps to improve the quality of the finished beer.

Wort is sanitary at the boiling point, and most yeast can be safely pitched and fermentation begun at 70° F. Beer-spoiling bacteria can thrive and reproduce rapidly at temperatures below boiling and above 70° F. It stands to reason that the faster you can transcend this danger zone, the more you lessen the chances of any bacterial contaminations taking hold and ruining the beer. Furthermore, rapidly chilling the wort increases the coagulation and precipitation of proteins. With proper chilling this "cold break" will settle out of suspension. If these proteins are not removed, they will create a haze in the finished beer.

13. It's hard to overpitch.

How much yeast is the proper amount? In most cases the right answer is *more*! From a technical standpoint the proper amount to pitch is somewhere between 10 million and 30 million cells of viable yeast per milliliter of wort.

The factors that affect the amount of yeast required to pitch and ferment a batch of beer are many, including gravity of the wort, fermentation temperature, yeast strain used, type of fermentation vessel, and myriad other factors. However, from the homebrewer standpoint it is very difficult to have an adverse effect on the finished beer by overpitching, and without a microscope, hemocytometer, or centrifuge, pitching volumes are almost impossible to accurately determine.

Overpitching a beer can result in shortened fermentation time. It will also undermine proper yeast health for successive repitching by not allowing the yeast to go through a proper growth phase. In this phase cells rejuvenate, and they rebuild their glycogen reserves at the end of the growth phase. These are all factors that can be important to a commercial operation with set production schedules and where a yeast strain is expected to be used for many successive batches of beer. The majority of homebrewers rarely

use a particular batch of yeast for more than just a few sequential batches of beer, so this is not really an issue.

Large pitching volumes have the advantage of reducing lag times and the opportunity for beer-spoiling organisms to multiply and produce off-flavors. While the potential for yeasty flavors does exist when using large pitching amounts, for the most part these can be avoided by racking at the proper time and maintaining proper fermentation temperatures. How much is a good volume to pitch? A pint of good slurry from a clean previous batch or cultured from a starter should result in a prompt and active fermentation in a five-gallon batch.

14. There's a time and place for oxygenation.

Much the same as with yeast pitching rates, there are many equations to determine the proper amount of air to inject into the cooled wort for optimum yeast health, usually in the neighborhood of eight to 12 parts per million.

The factors that affect this figure include wort gravity, temperature, oxygenation or aeration method and efficiency, and many others. Again, from the homebrewing standpoint the proper answer on how much oxygen to use is *more!*

As with yeast, without proper lab instruments it can be virtually impossible to determine the amount of dissolved oxygen in a sample of wort. It is better to err on the side of excess, because the problems that can occur from over-oxygenation in a homebrew are negligible compared with the problems that can happen when not enough is used.

Inadequate oxygenation can result in poor yeast health and performance, along with stuck fermentations and beers that do not attenuate or reach their expected terminal gravity.

A healthy dose of oxygen usually results in a shortened lag time,

vigorous fermentation, and good yeast health. Any excess oxygen that is introduced usually is removed or "scrubbed out" by the escaping carbon dioxide gas during the subsequent fermentation. Whether you're using the time-tested method of splashing the cooled wort into the fermenter or using any one of the commercially available oxygenation/aeration systems, don't hesitate to introduce more oxygen to the wort prior to pitching yeast. Be careful not to add too much when using pure oxygen.

Many homebrewers do make a mistake that will affect the flavor of the finished beer by introducing oxygen to the wort after the fermentation process has begun, usually by careless splashing during racking or bottling. Since the fermentation process is for the most part complete, any oxygen introduced will not be scrubbed out and will instead remain to react with other compounds in the beer to create staling and off-flavors.

15. Steady, constant temperatures protect wort from off-flavors.

Yeast is a living organism, and like any other creature yeast perform at their best when in a comfortable environment with an adequate supply of nutrients. The nutrients are supplied in the form of boiled and chilled wort, which will be fermented into finished beer.

The temperature at which this takes place has a dramatic effect on the flavor of the finished product. Ferment too warm and you'll get higher alcohols called fusels, which are associated with hangovers. They not only taste harsh, they are very difficult for our bodies to process and neutralize.

Temperatures that are too cold slow down the metabolism of the yeast. This can result in sluggish fermentations that stall before the beer has reached the proper terminal gravity. Butterscotch-like compounds called diacetyl can also result from fermentation temperatures that are too high.

Don't worry if you do not have access to a rigid, temperature-controlled environment. A five-gallon fermenter of wort will be slow to react to minor daily fluctuations in air temperature. Liquids change temperature much more slowly than the surrounding air and thus maintain a reasonably constant average if kept out of drafts or direct sunlight.

16. Two-stage fermentation clears beer.

In a two-stage fermentation the fermenting wort is transferred into a second fermenter after the initial vigorous fermentation subsides. Not only will this result in a cleaner-looking finished product but a cleaner-tasting one as well.

As the fermentation begins to slow down, the yeast flocculates (settles out) along with a substantial amount of protein trub. If the still-fermenting wort is allowed to remain in contact with this sediment, unpleasant yeasty characters and off-flavors can result.

Transferring the beer into a clean secondary fermenter for the remainder of the conditioning time allows additional settling to occur. It also allows time for the flavors in the young beer to mature.

17. Darkness is a good thing.

Much has been written about using brown glass bottles to help prevent the light-struck, skunky aroma that can result from hop compounds reacting with ultraviolet light. This reaction can occur at any time, so remember to keep those clear glass carboys covered up or in a closet to prevent "preskunking" the beer long before it reaches the bottle.

18. Time is on your side — with unfiltered beer.

If that latest batch of beer just doesn't quite seem to taste right,

it doesn't necessarily mean it's time to start opening bottles and fertilizing the roses. Providing the flavors are not the result of a bacterial contamination, the further conditioning that takes place in the bottle or keg can result in a mellowing of flavors over time. An unpleasant beer can sometimes turn into a quite drinkable one. This process can take weeks or even months. So unless you need the bottles for something else, forgetting about them and sampling again at a later date can result in some very pleasant surprises.

19. Talking beer can improve beer.

Brewing is a science that, while quite old, is evolving. Some books that were on the cutting edge 15 years ago are now quite dated and full of information that will actually hurt your brewing. That's because equipment and ingredients have changed, and thus so have proper techniques. The best way to stay current is by reading and talking to others who brew.

Most brew-shop owners and brewpub brewers are more than happy to talk about the hobby. After all, most brewers brew because they enjoy it. It is always fun to sit down over a pint of homebrew and talk shop. Just be a little discreet; when the delivery truck is unloading a pallet of malt to the shop or the brewers are attempting to remove 2,000 pounds of spent grain from the mash tun is probably not a good time to approach and say, "Hey, can you answer a quick question?"

20. Experimentation is the soul of brewing.

Many of civilization's greatest scientific discoveries and advances were made by accident. Yet without these "accidents" we would be without many of the things that we take for granted today.

The same is true for brewing; the best way to find out what will

happen if you try something new is to do it. Just because you've never read about somebody using breakfast cereal or starch-based packaging material in a mash doesn't necessarily mean it won't work. Be open to new ideas, and don't be afraid to experiment.

Brewing is every bit as much an art as it is a science. By working to understand the processes that can

take place every time you make a batch of homebrew, you can better exercise artistic freedom to continually create better, more flavorful beers as you improve your brewing skills. 

John Oliver is a BJCP certified judge who works with the science of brewing as assistant brewer for BJ's Brewery in Brea, Calif.

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4 Classic Beers and

One of the real joys of homebrewing is the first time you manage to make a beer that makes your friends say, "Hey, this tastes just like..."

As you may have read in these pages before, cloning your favorite beer (or someone else's, for that matter) is not always as tricky as it first seems. It takes some patience, some knowledge of styles and process, and careful attention to detail.

What follows are recipes and recommendations intended to make it a step easier for you to brew something very close to four classic beers from four classic brewers. They have all become world-class standards, serving as models against which other beers of their style are measured. But they are all quite clonable if you are willing to take the time to do it right.

Some general advice: The correct hops and yeast are

crucial. This is not to say that you can't brew something enjoyable and praiseworthy using a different yeast or different hops, but if what you are looking for is to be close to the original, then get ingredients that are as close as possible to what the professional brewers use.

Use liquid yeast

strains that are similar to what the pros use, if not the actual strains they use. Use fresh hops of an appropriate variety. And the more

by Scott



How to Make Them

you derive your fermentables from grains, the better you will be able to fine-tune the color and body of your beer.

R. Russell

Newcastle Brown Ale (2 batches at 2.5 gallons)

The standard for all English brown ales, Newcastle is a “northern brown” style, which means it’s a little higher in alcohol, lighter in color, and less sweet than its southern London-area counterparts.

Traditionally, Newcastle

is brewed as two separate beers, one stronger than the other, and blended at bottling. This recipe will allow you to recreate the sweet, malty-chewy flavor with medium hop bitterness that is truly a classic.

One alternative would be to double the ingredients as given below, brew two five-gallon batches, and try different percentages in your blend — four parts of the lesser beer to one of the stronger, for instance, 3 to 1, or 2 to 1 instead of 1 to 1.

Ingredients:

Batch One

- 1 lb. crystal malt, 35° Lovibond
- 1 oz. chocolate malt
- 3 lbs. unhopped light dry malt extract
- 0.5 lb. brown sugar
- 0.5 oz. Challenger or Target hops (6% alpha acid; 3 AAUs) for 60 min.
- 0.25 oz. Northern Brewer hops



TODD HAMMOND PHOTOS

(8% alpha acid; 2 AAUs)
for 30 min.

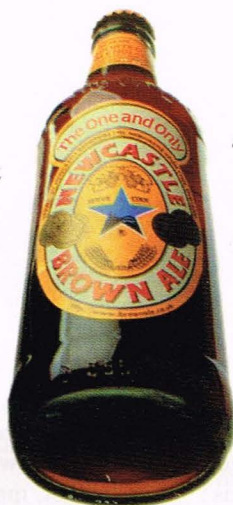
- London ale yeast (Wyeast 1318 or 1968 or similar)

Batch Two

- 0.5 lb. crystal malt, 35° Lovibond
- 1 tsp. chocolate malt
- 2 lbs. unhopped light dry malt extract
- 0.25 lb. brown sugar
- 0.25 oz. Challenger or Target hops (6% alpha acid; 1.5 HBUs) for 60 min.
- 0.25 oz. Northern Brewer hops (8% alpha acid; 2 HBUs) for 30 min.
- London Ale yeast culture (Wyeast 1318 or 1968 or similar)
- 1/2 cup corn sugar for priming

Step by Step:

Brew batch one first. Plan to brew the second batch two weeks later.



Heat 2 gal. water to 150° F and steep grains for 45 min. Remove grains, add dry malt extract and brown sugar, and bring to a boil. Total boil is 60 min. Add

Target or Challenger hops, and boil 30 min. Add Northern Brewer, boil another 30 min. Cool, top up in fermenter to 2.75 gal., pitch yeast at 68° F.

Ferment warm (65° F) for two weeks, then brew batch two according to the same directions for batch one. Ferment both batches for one week, then blend them in a larger (6 gal.) fermenter or carboy. Condition two weeks. Prime with corn sugar, bottle, and age two to four weeks at 58° F

OG = 1.050 total (1.070 batch one, 1.030 batch two)
FG = 1.012-1.018
30 IBUs

Alternatives:

If you don't have two small fermenters, you may wish to make this as one batch. But understand that part of the character of Newcastle comes from the blending of rich and weak, old and young. If you decide to make it as one five-gallon batch, simply combine the recipes, making sure to add up not only the grains, extracts, and hops, but also the mash and sparge water.

All-grain brewers can substitute a simple infusion mash, 4.5 lbs. of pale malt (plus the crystal and chocolate) in 1.75 gal. at 152° F, sparging with 2.5 gal. at 168° F for batch one; 3 lbs. of pale plus crystal and chocolate in 1.25 gal. at 152° F and a sparge of 2 gal. at 168° F for batch two.

Pilsner Urquell

The standard, of course, of all light lagers the world over. This is, if not the first ever made, certainly



Congratulations to Bruce Hammell and Kent Brehm, winners of the gold medal for Robust Porter at the AHA National Homebrew Competition. According to Mr. Hammell, "There is a substantial difference between floor malted barley and the mass produced product. Flavor and yields are worlds better and I believe that it helped us produce a world class beer." We thank them for choosing Warminster Maltings traditionally floor malted Maris Otter barley to brew their award winning beer. The best Malting barely is carefully processed by hand at Warminster to provide the finest malt for your handcrafted beer. Ask your retailer or call us today. Wholesale inquiries invited.

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CIRCLE 37 ON READER SERVICE CARD

CIRCLE 22 ON READER SERVICE CARD

the first to gain international admiration and acclaim. The brewers in Pilsn, now in the Czech Republic, created the style that gave us, for better or for worse, all light lagers and pilsner styles, from Heineken and Beck's in Europe to Corona, Budweiser, and Miller in North America. An essential characteristic of Urquell is the hops. The Saaz hops grown in the nearby valleys are arguably the finest hops in the world. Their characteristic aroma and flavor are part of what sets Urquell apart from all the others.

Ingredients:

- 4 lbs. lager malt
- 3 lbs. unhopped extra-light dry malt extract
- 2.5 oz. Saaz hops (4% alpha acid; 10 HBUs): 2 oz. for 75 min., 0.25 oz. steeped for 15 min., 0.25 oz. for dry hopping



- Czech or German lager yeast slurry (Wyeast 2278 or similar)
- 7/8 cup corn sugar for priming

Step by Step:

Heat 1 gal. of water to 148° F, mix in cracked malt, and hold at 135° F for 30 min. Add 1 gal. more of water at 180° F, hold mash at 150° F for 60 min. Sparge with 2 gal. of 170° F water.

Add the dry malt to the kettle, and bring to a boil. Total boil is 75 min. Add 2 oz. of the Saaz hops, boil 75 min. Add another 0.25 oz. Saaz, turn off heat, and steep for 15 min. Cool, top up to 5.25 gal. with chilled, pre-boiled water. Cool to 65° F. Add the remaining 0.25 oz. Saaz and pitch yeast slurry.

Ferment cold (40° to 50° F) for three to four

weeks. Rack to secondary, age six weeks at 35° F. Prime with corn sugar, and bottle and condition four to six weeks.

OG = 1.052

FG = 1.016

42 IBUs

Alternatives:

All-grain version: Increase lager malt to 8 lbs. plus 0.5 lb. carapils or cara-Vienne malt. Mash in 1.5 gal. water at 135° F plus 1.5 gal. more at 180° F to reach 150° F for 60 min. or whatever you feel comfortable with for this style of beer.

All-extract brewers can simply increase the dry malt extract to 6 lbs. and steep 0.5 lb. each of lager malt and carapils or cara-Vienne for 30 min. in 2 gal. of water at 150° F before adding extract.

Remember, the Saaz hops are crucial to the flavor of Urquell. Don't mess with them, and get fresh ones.

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Celebrator Doppelbock (by Brauerai Ayinger, also known as Fortunator in Germany)

Beginning with Paulaner's Salvator, doppelbocks in Germany have been named with words ending in *-ator*. Doppelbocks are generally stronger (but not twice as strong) as regular bocks, richer in flavor, beers to savor and contemplate slowly.

As lagers, they are smooth and clean tasting. Doppelbocks tend to be darker than other bocks, probably because of the traditional use of extra-dark malts to intensify the body and rich flavor. The ideal bock recipe would make use of a decoction mash, but this one is quite a bit simpler, using a single-step infusion.

Ayinger is the biggest and perhaps the

best known Bavarian brewery outside of Munich.

Ingredients:

- 1 lb. lager malt
- 5 lbs. Munich malt (German type such as Weyermann)
- 0.5 lb. dark crystal malt, 90° Lovibond
- 1 oz. chocolate malt
- 5 lbs. unhopped amber dry malt extract
- 2 oz. Hallertauer hops (4% alpha acid; 8 AAUs) for 60 min.
- Munich lager yeast culture (such as Wyeast 2308)
- 6-10 g. dry wine yeast
- 2/3 cup corn sugar for priming

Step by Step:

Heat 2.25 gal. water to 165° F, mix in cracked grains, hold at 152° F for 75 min. Sparge with

3 gal. of water at 170° F.

Add dry malt to runnings in kettle, and bring to a boil. Add hops and boil 60 min. Cool, and top off in fermenter with enough pre-boiled, chilled water to make up 5.25 gal. At 65° F, pitch lager yeast.

Ferment cool (55° F) for two weeks, then add wine yeast and ferment for two more weeks. Rack to secondary and age cold (38° F) for four to six weeks. Prime with corn sugar, bottle, and condition cold for eight weeks.

OG = 1.080

FG = 1.025

30 IBUs

Alternatives:

All-grain version: Increase lager malt to 8 lbs., and increase mash water to 4.5 gal., sparge water to 5 gal. (omit the dry malt, of course). Be sure to adjust boiling time for evaporation and the hop schedule.



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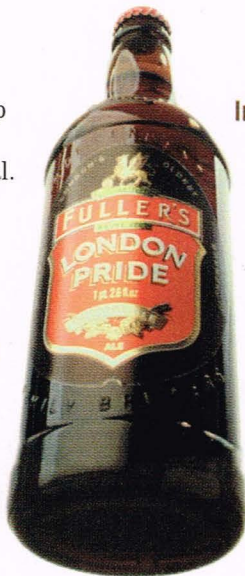
CIRCLE 24 ON READER SERVICE CARD

Extract version: Steep crystal, chocolate, and 1 lb. Munich malt in 2 gal. at 150° F for 30 min. before adding extract. Increase dry malt to 9 lbs.

Fuller's London Pride

Fuller's may just be the most "Londonian" of London breweries. Its products have remained firmly English over the years, reflecting an unparalleled dedication to tradition. Its London Pride is its "best bitter," a little bigger and hop-pier than its "Chiswick Bitter," its "ordinary," and less so than its ESB.

Fresh and on draft, London Pride is true to its name. Even in bottled form, exported to the United States, it outclasses most of the better-known English bitters.



Ingredients:

- 3 lbs. pale malt
- 4 oz. crystal malt, 50° Lovibond
- 0.5 lb. brown sugar
- 2 lbs. unhopped light dry malt extract
- 1.5 oz. Fuggle hops (4% alpha acid; 6 AAUs): 1 oz. for 75 min., 0.5 oz. for steeping
- 2.5 oz. Goldings hops (4% alpha acid; 10 AAUs): 2 oz. for 75 min., 0.5 oz. for dry hopping
- London ale yeast culture (such as Wyeast 1968)
- 2/3 cup corn sugar for priming

Step by Step:

Heat 1.5 gal. water to 166° F. Mix in cracked grains and hold mash at 153° F for 90 min. Sparge with 2 gal. at 168° F.

Add dry malt and brown sugar and bring to a boil. Total boil is 75 min. Add all but 0.5 oz. of each

of the hops, and boil 75 min. Turn off the heat and add the rest of the Fuggle hops. Chill and top off with enough pre-boiled, chilled water to make 5.25 gal. At 68° F add the rest of the Goldings hops and pitch yeast.

Ferment warm (68° F) for two weeks, rack to secondary, and age cool (58° F) for two weeks. Prime with corn sugar, bottle, and condition for two weeks.

OG = 1.044

FG = 1.012

37 IBUs

Alternatives:

All-grain version: Replace the dry malt with 3 lbs. of pale malt, increase mash water to 2.5 gal. and sparge water to 3 gal.

Extract version: Omit the pale malt and start by steeping 0.5 lb. toasted pale malt and the crystal in 2 gal. of water at 150° F for 30 min. Increase dry malt to 4 lbs.

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BLENDING BEERS *for Flavor*

Blending beer with other beer or beverages can salvage an off-batch or fine-tune a beer's flavor profile.

Blending refers simply to the mixing of liquids. For the brewer it can be further defined as the mixing of beer with other beers or other liquids before the product is served. There is a distinction between blending and diluting. Dilution is the blending of a strong beer with water to produce a normal-strength beer. This is commonly referred to in the brewing industry as high-gravity brewing since a higher-gravity wort is used to produce the pre-blended beer.

Instead of changing the strength of a beer, blending is often used to change the taste. Blend a beer that is too bitter with a beer that is less hopped for a medium-hopped brew, for example.

While blending can play an essential role in saving an off-batch of beer from the drain, it can also be used to enhance beer. You can blend two perfectly drinkable beers — or even beer and another beverage — to create a different, unique beverage.

Save the Ales

Blending is the rule rather than the exception in the brewing industry as

almost every “macro” beer (commercially produced on a large scale) is blended before packaging. This is almost to be expected because the process of making beer involves a living microbiological process (fermentation) that can be markedly affected by small changes in the state of the yeast cells employed. And blending is one manner by which large breweries produce a consistent product.

Blending is also the only way to make use of an otherwise off-batch of beer.

But there is essentially no way to salvage a beer when an unwanted microbe has contaminated it. It is better to just pour it down the sink than to taint an even larger quantity of good beer. There are exceptions, of course. One homebrewer didn't want to waste a batch that was likely contaminated by bacteria, so he blended half of it with another batch of beer, added lots of cherries, and called it a krieg. The beer had a tart quality to it and won him a first-place ribbon at a local homebrewing competition. (This experience saving a contaminated beer is the exception, though, and not the rule.)

A good use of blending is in a

by Victor E. Buckwold





batch that for a variety of reasons is not perfect but is still drinkable. You can make good use of this beer by blending it with another beer. One brewer had success with this strategy when he made a batch of beer that ended up being about 3.2 percent alcohol by volume (ABV) instead of the 6.5 percent alcohol brew he usually made. He had tried to drastically reduce the time spent in his mashing and lautering routine.

At the time he considered it to be the worst batch of beer that he had ever made, but when the next batch was ready (6.3 percent alcohol), he mixed the two to see what would happen. The beer was good, and he used this blended

batch to win a second-place ribbon in a homebrewing competition.

Blending in Classic Beer Styles

Some of the most famous classic beer styles have traditionally employed a blending step before packaging. These include gueuze and kriek, old ale, old porter, porter, Scottish ale, stock ale, stout, Vienna beer, weinbier (beer and fermented boiled wine), and wheat beer.

The "old beers" are typically blended from one-third of an extensively aged beer (one to three years old) and two-thirds of a younger beer. The aged beer is left in vats for prolonged maturations, termed vatting, in which the flavor profile develops slowly. The vatting process is often

associated with an acidification of the beer, as well as the appearance of solvent-like characteristics thought to be due in part to the presence of *Brettanomyces* and other microorganisms in the vats. Apart from the microbes, other changes in the flavor profile of strong beers also occur during aging.

Regardless of the mechanisms involved, the vatting and blending procedure provides an economical and timely way to produce more beer with an aged-beer character. In a similar manner, the production of barleywines might well be served by this strategy of blending one-third of an aged product with two-thirds of a younger beer. The Guinness Stout produced in Ireland

Calculating Your Blend

When blending beers before bottling or kegging, as opposed to just before serving them, you need to be careful not to introduce air into the beer and potentially damage it through oxidation. Carefully transfer it into the racking container, and fill the racking container from the bottom up to avoid splashing.

Any beer or other liquid that you wish to blend should be microbe- and oxygen-free and preferably carbonated. When the blending is undertaken before the beer has been filtered, you do not need to worry as much because yeast act as natural antioxidants.

For bottle-conditioned or kegged beer, add priming sugar proportional to the complete volume that is to be packaged. Be sure to allow five to 10 minutes for the complete mixing of the liquids before bottling, or less time if you stir the solution with your racking cane.

Calculations

Technically you must consider the alterations that occur in alcohol content, hop bitterness, and beer color relative to the new volumes.

Take for example the case of 40 beer bottles (batch one) at approximately 20 IBUs, 8 HCUs (homebrew color units), and 3.2 percent alcohol by volume (ABV) to be mixed with five gallons of a newly prepared batch (batch two) with 30 IBUs, 13 HCUs, at 6.3 percent ABV.

First you need to know the volumes of both beers. The most accurate manner is to measure the volumes directly by pre-marking the racking container with the volumes appropriate to you, such as four gallons, 4.5 gallons, five gallons. For the sake of demonstration, this example makes some estimates. Let's say you know that with this particular equipment and these bottles that you get 10 bottles per U.S. gallon, so for batch one you have:

$$40 \text{ bottles} / (10 \text{ bottles/per gal.}) = 4 \text{ gallons.}$$

But the beer is bottle conditioned and you lose 5 percent of the volume when you decant to leave behind excess yeast sediment so:

$$4 \text{ gallons} - (0.05 \times 4 \text{ gal.}) = 3.8 \text{ gallons}$$

This gives you a total volume of 3.8 gallons of batch one and five gallons of batch two, which equals 8.8 gallons of blended beer. Now you can predict the alcohol content of the blended beer:

$$(3.8 \text{ gal.})(3.2\% \text{ ABV.}) + (5 \text{ gal.})(6.3\% \text{ ABV}) = 43.66$$

Now calculate for 8.8 gallons:

$$43.66 / 8.8 \text{ gal.} = 5\% \text{ final ABV}$$

Hop calculations are similar. So for the bitterness content of the blended beer we now have:

$$(3.8 \text{ gal.})(20 \text{ IBU}) + (5 \text{ gal.})(30 \text{ IBU}) = 226$$

Now calculate for 8.8 gallons:

$$226 / 8.8 \text{ gal.} = 26 \text{ final IBU}$$

You can try the calculations for color. Just remember that with color, the calculations are less accurate, especially with darker beers that may end up being darker than predicted. You should arrive at 11 HCUs for the blended beer.

is also said to have been produced from the blending of a vatted beer made in wooden casks.

Ray Daniels, in *Designing Great Beers: The Ultimate Guide to Brewing Classic Beer Styles* (Brewers Publications), offers other examples of the use of blending. In the case of fruit beers, Daniels notes, it is much easier to blend a batch of beer that contains no fruit with one that contains much fruit to achieve a nice balance in the finished product. Porter was originally produced as a pre-packaged blend of beers. And wheat beer traditionally employs a dual fermentation involving normal yeast and lactic-acid-producing bacteria to lower the pH of the beer.

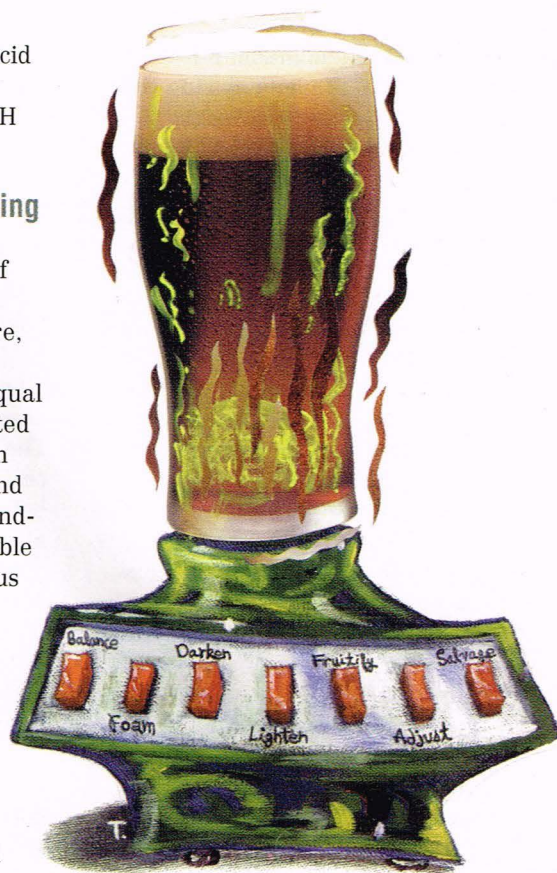
All cases of mash and wort acidification in Germany employ dual separate fermentations involving yeast and *Lactobacillus*. Even though lactic acid can be synthesized chemically, its use in brewing is expressly prohibited under the beer purity law of Germany (Reinheitsgebot). So the

German brewer must use lactic acid derived from naturally produced bacterial cultures to reduce the pH of his beer.

Blending Beers After Packaging

Draft and bottled beers are frequently blended in a variety of manners just prior to their consumption. In Europe as elsewhere, one of the most popular ways to enjoy beer is by mixing it with equal parts of lemon-flavored carbonated water. This is termed a shandy in England, a radler in Germany, and a clara in Spain, and its long-standing popularity has been responsible for the development of the various lemon beers, lager and lime drinks, and alcoholic lemonades that have recently appeared in the market. Probably you already know the advantage of adding a slice of lime to your Corona or Tecate.

Carbonated water without lemon flavoring can also be used



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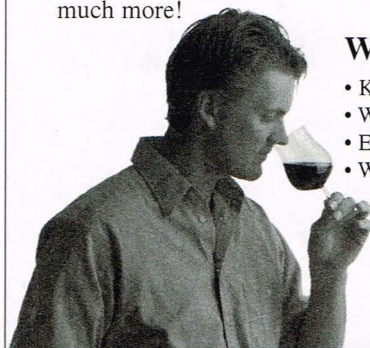
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instead of the lemonade, but this mixture lacks the lemony zing and is much less commonly used. Carbonated lemon-flavored water

seems to work better than lemonade, but both are fine. If straight lemonade is used, then the overall carbonation of the beer is reduced.

Blending at Big Breweries

Blending is standard at large breweries. Brewers who are responsible for turning out thousands of gallons of beer that must be free of even minor variations consider blending a necessity.

The process is known as standardization among large breweries, meaning to create a standard, consistent product. The brewer starts with a wort of 1.064 to 1.072 original gravity (or 16° to 18° Plato, the measure preferred by professional brewers). This is considered high gravity in the macrobrewing world, where light-bodied beers

prevail.

The wort is diluted with 30 percent to 40 percent sterile, deaerated water and fermented. The beer is then filtered, matured, carbonated, then standardized before kegging or bottling. It also might sit in a secondary conditioning tank to adequately "marry." Standardization is done as late in the process as possible to ensure the best blending quality and least amount of change afterward.

This way the brewery can precisely control alcohol content, color, and other characteristics.

If you wish to try this and lemon-flavored carbonated water is not available to you, add the juice of one lemon to a pint or so of carbonated water and invert the bottle a couple of times before using it. Fanta lemon soda and Sprite also blend well with beer.

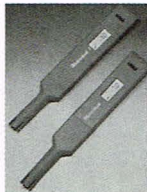
Other fruit juices or sodas may also blend well with beer depending on your particular tastes. A variety of "mixed beer drinks" are now produced commercially and are quite popular in Germany. These include, in addition to the lemon-flavored beers, beer and cranberry juice, and beer and cola mixtures. Coffee liqueur goes well with stout, as does coffee ice cream. Beer and tomato juice still is widely served around the world and is a very tasty combination. One of the fastest growing trends in the spirits sector is toward these prepackaged mixed beers and other "alcopops" that are enjoying tremendous popularity worldwide.

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types at serving is also quite common. A very dark beer is often mixed with a light beer to produce a "half and half" or a "black and tan" if it is layered instead of mixed. A black and tan is also available commercially. Some homebrewers make a beer that is so dark and hoppy that nearly everyone else must mix it with at least 50 percent of a more tame beer before consumption. The flavor profile of beer can be altered drastically by blending. This strategy then, serves not only to "tame" a beer but also can make positive contributions to the beer's overall flavor and appearance.

Blending for Beer Enhancement

Blending can be useful to "adjust" a beer slightly before packaging. The potential is endless. The only difficult thing is to try to save some of your beer so that you will have some reserve stocks to touch up your latest batch.

If you find that you are not

satisfied with the color, hop composition, or foam stability of the beer that you just finished fermenting, simply blend in, for example, 30 percent to 50 percent of one of your old batches that was outstanding in this regard. So if the color of your beer was not up to par, blend in some stout. If the bittering component was lacking, blend in some India pale ale. If the foam formation and stability of your latest batch was not up to par, blend in one that has these characteristics.

This last point deserves reinforcement. Inadequate foaming is a common complaint brewers have about their beer. Instead of accepting a beer without a good head, why not simply blend in another beer that has these characteristics?

Trying New Things

Beyond fixing or improving new beers, you can use blending to try new things and take advantage of the otherwise depressing lack of quality beers that are sometimes

available to us. Blend 50 percent of whatever soda or juice you have available to you into the beer before you drink it. Drastic situations call for drastic measures.

Before you dismiss this idea as ludicrous, try it and keep your mind open. You never know, you may find yourself trying the same blends at home with your favorite beers.

The only caveat to mention concerns the use of commercial beers for blending with your own beers. While this might be all right for your own personal consumption, it certainly seems immoral to try to pass off a beer that contains 50 percent store-bought beer as your own in a competition setting. Use common sense, and have fun. If you're not happy with the result, blend your mistakes into the next batch. 

Victor E. Buckwold, Ph.D., is a microbiologist who has been brewing beer for four years and drinking it much longer.

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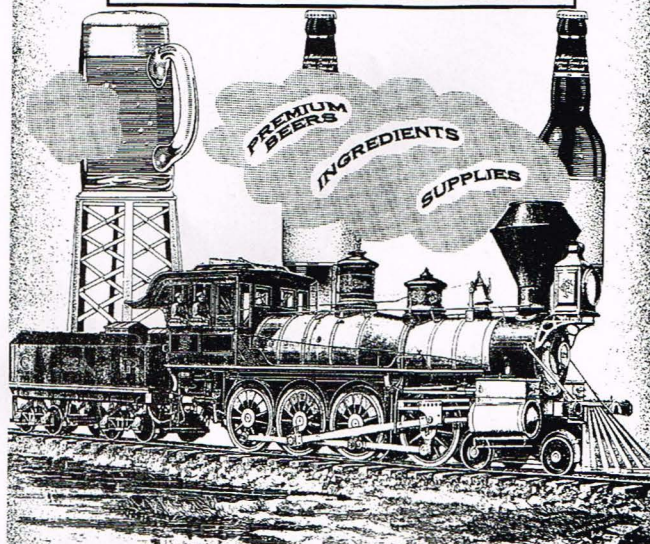
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CIRCLE 20 ON READER SERVICE CARD

Build Your Own Electric Brew Stove

by Tom Snyder

As I scoured the scorch marks off the top of my wife's white kitchen stove for the umpteenth time, I said to myself, "There has got to be a better way to boil wort for beer!"

The brew books I had read and the people I had talked to focused on the big gas burners that could be used for this task. I also knew from what I had read and heard that these burners must be used outside or in some place like a garage where there would be adequate ventilation. Since I don't have a garage and I live

in Kansas where at least four months out of the year it's too cold to brew outside, this didn't seem like a viable solution to the problem. I also considered the fact that I had just obtained a 16-gallon keg that I wanted to use as a brewpot.

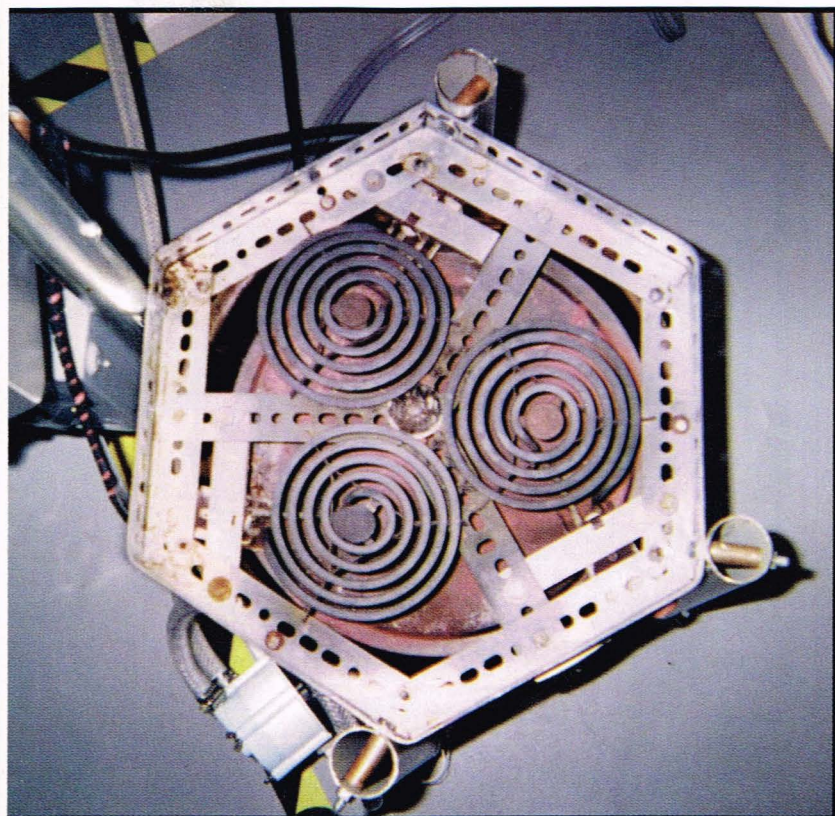
No, the kitchen stove was just no longer the answer for my brewing needs.

What I needed was a heat source hot enough to boil water in this keg and yet clean burning enough to be used indoors. Electricity seemed the likely answer.

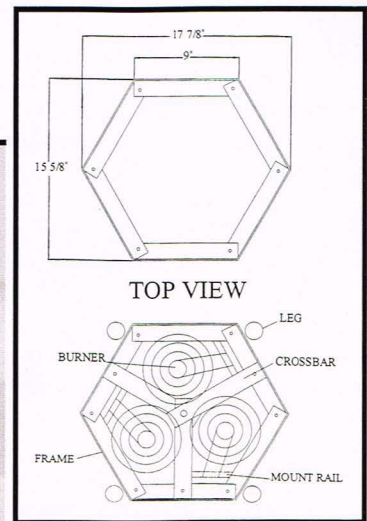
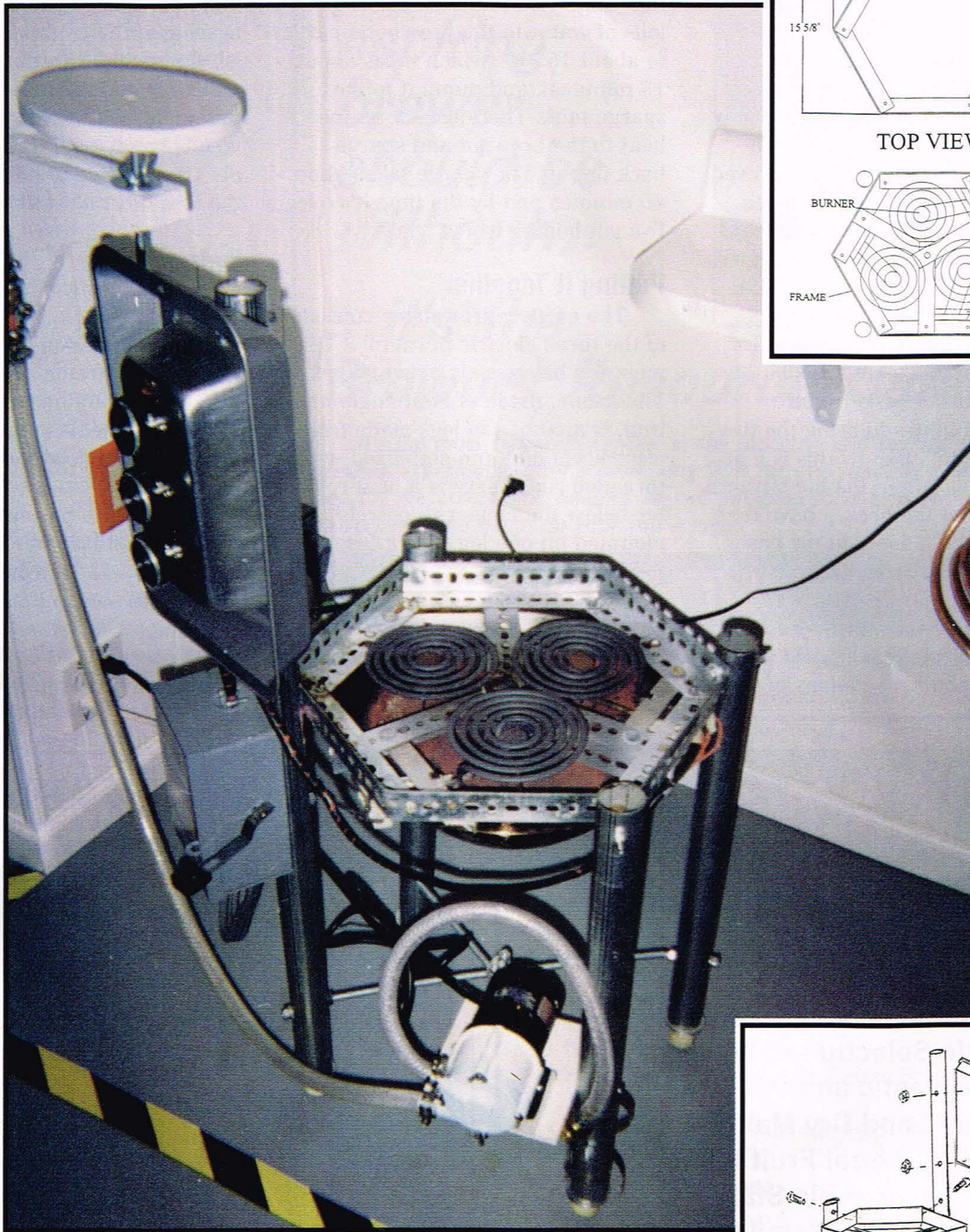
Inspiration

I toyed with the idea of using the heating element from an electric hot water heater, but then I realized that it would require too much modification — I admit to being a little lazy — and I didn't think it would become hot enough to actually boil the water. Whatever I decided to do, it would have to be accomplished within the scope of what I know about electricity and with my limited shop tools. Then one day, about a year ago, it came to me. If I could group enough 6-inch electric burners under the keg, I could muster enough heat to bring my wort to a boil.

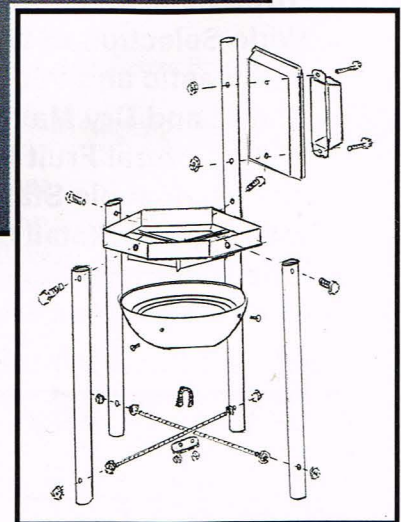
First I had to determine how many of these small electric burners I could arrange in the 15½-inch diameter of the keg. I drew it all out on a big piece of cardboard and found that I could get an array of three burners under the bottom of the keg, but



TOM SNYDER PHOTOS/DIAGRAMS



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would that generate enough heat to boil the brew? A quick call to the expert at the local used-appliance store put my fears to rest.

As it turned out, a six-sided frame of 1½-inch angle iron, each side 9 inches long, worked perfectly to fit the outside diameter of the keg. This configuration also allowed me to divide the frame into three equal spaces to fit the burner elements into a triangle pattern under the keg (see diagram on page 45).

The three burner elements would give 65,000 to 90,000 BTUs depending on make and model. I use GE brand burners and require around 40 minutes to bring the five gallons to a boil. I know this is a little while longer than the big burners take, but what the heck, I have time. Besides, I'll be indoors in my basement brewroom, nice and warm.

The procedure that I use for a single-infusion mash never requires me to boil five gallons of cold water anyway. I heat three gallons of

water to about 180° F in 20 minutes or so, then pump it up to my mash tun. Then I add another three gallons of water to the brewpot, heat it to about 165° F (which takes about 15 minutes), and pump it to the sparge tank. Then I crank up the heat to the brewpot and sparge back into it. The sparge takes about 45 minutes and by the time it's over, I've got boiling wort.

Putting It Together

The electric brew stove consists of the three electric burners mounted below a six-sided frame. The frame, made of bent angle iron, is attached to legs made from electric conduit and stabilized with threaded rod. There is a heat reflector below the burners, controls mounted on one leg, and a fuse box for safety.

You can assemble the individual components separately and then put it all together. Just predrill holes for the bolts and secure them with nuts

and washers. Follow the diagram on page 45. Attach the legs to the frame and heat exchanger. Add the rods for bracing at the bottom, and then finish the wiring with the control assembly and the fuse box. If you are unfamiliar with wiring, ask a friend who is handy with electricity and electrical wiring to help you set up the fuse box and wall plug.

Parts

- 3 6-inch electric burners with controls
- 8 feet of 1½-inch-by-1½-inch steel angle iron (frame and crossbars)
- 10 feet of 1½-inch outer-diameter steel electrical conduit (legs)
- 16-inch stainless steel bowl (heat reflector)
- 13-inch pizza pan (heat reflector)
- Steel bread-loaf pan (control panel)
- 9-inch-by-13-inch-by-2-inch steel cake pan (control panel)
- 30 amp, 220 volt fuse box and fuses
- 10¼-inch-by-20-by-⅝-inch bolts, nuts, and lock washers



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- (frame and crossbars)
- 2 1/4-inch-by-20-by-24-inch all-thread rod with 8 nuts and washers ("X" brace)
- 8 5/16-inch-by-18-by-2-inch bolts, nuts, and lock washers (legs, fuse box, and control panel)
- 5/16-inch "U" bolt and mounting plate ("X" brace)
- 4 #8 sheet-metal screws (pizza pan in bowl)
- 4 1/4-inch-by-20-by-2 1/2-inch bolts, nuts, and lock washers (bowl-to-burner frame)

Keg Platform

One of the more important parts of this unit is the six-sided platform for the keg. A 54-inch-long piece of 1 1/2-inch angle iron is used. Make a single cut in one wall of the piece every 9 inches. Bend the piece into the hexagon shape so that the corners of the cuts overlap each other. In each overlap area drill a hole through both walls and insert a 1/2-inch-long bolt and nut so the hexagon will maintain its shape.

I drilled the end of each bolt and used a center punch to mushroom it out so the nuts would not come loose through repeated heating and cooling cycles. Welding would work also, but I don't have a welder.

The rest of the 8-foot section of angle iron is used to make the crossbars for the burner assembly. The three crossbars will attach to the sides of the platform (evenly spaced around the edge) and meet in the middle. Cut three 8 3/4-inch-long sections. Drill holes through the ends of the pieces. Use a bolt and nut to attach the crossbars in the middle and where each piece rests on the edge of the frame. You are now ready to attach the burners to these bars and the frame.

The Burners

An important order of business is to find an old working electric stove...cheap; price is always a concern, you know. As luck would have it, my wife came home from work and showed me a classified ad in a local paper. Someone was giving away a working electric stove. All I had to do was go get it. The price

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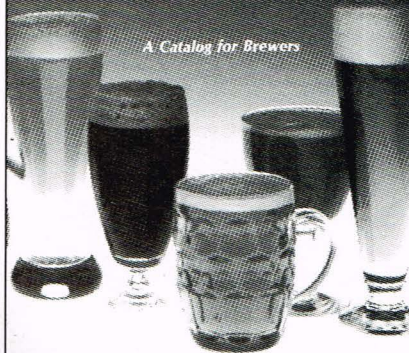
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was perfect, so I got it and hauled it home. The stove had four burners on it. Unfortunately, only two of them were the size I needed; the other two were too big. With another call to the used appliance store, I worked out a trade — the two stove coils I wasn't going to use for one small burner element that I could use.

From the stove I carefully took off three controls and burner sockets, never disconnecting the wires from the controls. Make sure that you do not damage the special insulation on the wires. The insulation will keep the burners from shorting out later on the metal frame. The only place I disconnected the wires was from the sockets. I positioned the sockets on mount rails (see diagram on page 45) attached to the crossbars on the frame to form a nice tight triangle pattern, but not touching each other, and secured them with the same screws that were used to attach them to the stove.

The Legs

Make the legs from 1 1/2-inch outer-diameter steel electrical conduit. It's strong and cheap, about \$8 for a 10-foot stick. I am sure other material could be used to make the legs, but just remember that the top of them will become hot and that they must hold about 80 to 100 pounds.

Three of the legs are 24 inches long and one is 40 inches. I mounted the controls on the longer leg.

The Controls

The temperature controls for the burners are arranged on a steel bread-loaf pan that is mounted to the inside of a 9-inch-by-13-inch-by-2-inch steel cake pan used here for a splash shield. The wiring from the burners runs up the tall leg, into a hole drilled in the side of the cake pan, and into the bread pan. The knobs are mounted to the outside of the bread pan (technically the bread pan's bottom, which is now the face).

The Heat Reflector

Attach a 16-inch-diameter stainless steel bowl and a heavy-duty 13-inch-diameter pizza pan to the legs about 1 1/2 inches under the burner assembly to serve as a heat reflector. The pizza pan rests on the inside wall of the bowl, about 1 1/2 inches to 2 inches deep. It is held in place by sheet-metal screws in the legs that extend through the outside of the bowl. The screws should just skim the top rim of the pizza pan, wedging it into position.

I purchased both the bowl and pizza pan at the local Wal-Mart for about \$10. Depending on the configuration of your sockets and how you mount them (they might hang down below the burner and into the top of the bowl), you might have to customize the bowl a little with some tin snips to create room for the wires to run out of the bowl and up the leg. Make certain that none of your wires from the sockets is pinched or touching any sharp edges

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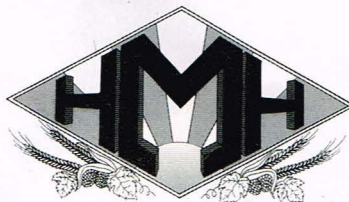
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that could cut into its insulation.

Run all wiring the shortest route out of the bowl around to the control panel.

Supports

I used two 3-foot lengths of 1/4-inch threaded rod to form the "X" braces between the legs about 3 inches up from the bottom and a "U" clamp to join the "X" brace together where it crosses.

Wiring

For safety's sake I added a 220 volt, 30 amp fuse box with a 30 amp heavy-duty pigtail cord on the same leg under the controls so I could turn off all power to the stove when it was not in use. Make certain the pigtail and plug match the receptacle you intend to use.

It's nice to have a pilot light on the control panel also, so you are reminded when the fuse box is on. I do highly recommend using ground fault protection. Remember, you're dealing with water and electricity here!

Add-Ons

I've been using this device for about eight months and have yet to have any trouble with it. The electric burner coils sit about 3/4 inch to 1 inch away from the bottom of the keg, so there are no real hot spots on the bottom of the keg and wort scorching or burning is not a problem.

You might choose to add wheels or levelers to the legs. If you add wheels, make sure you can lock them so the stove does not roll around while you're using it.

This project should not prove to be too difficult if you have a good basic knowledge of electricity and a few tools, such as a hacksaw or metal-cutting blade on a table saw, tin snips, drill, and an assortment of pliers, wrenches, and screwdrivers. If you have any questions about what you're doing, get help from a qualified electrician. I did!

Tom Snyder is a homebrewer in Overland Park, Kan.

Key to Off-Beat Beers: Finding Balance

by Julie Slama

Brewer: Mark Jilg

Brewery: Craftsman Brewing Co., Pasadena, Calif.

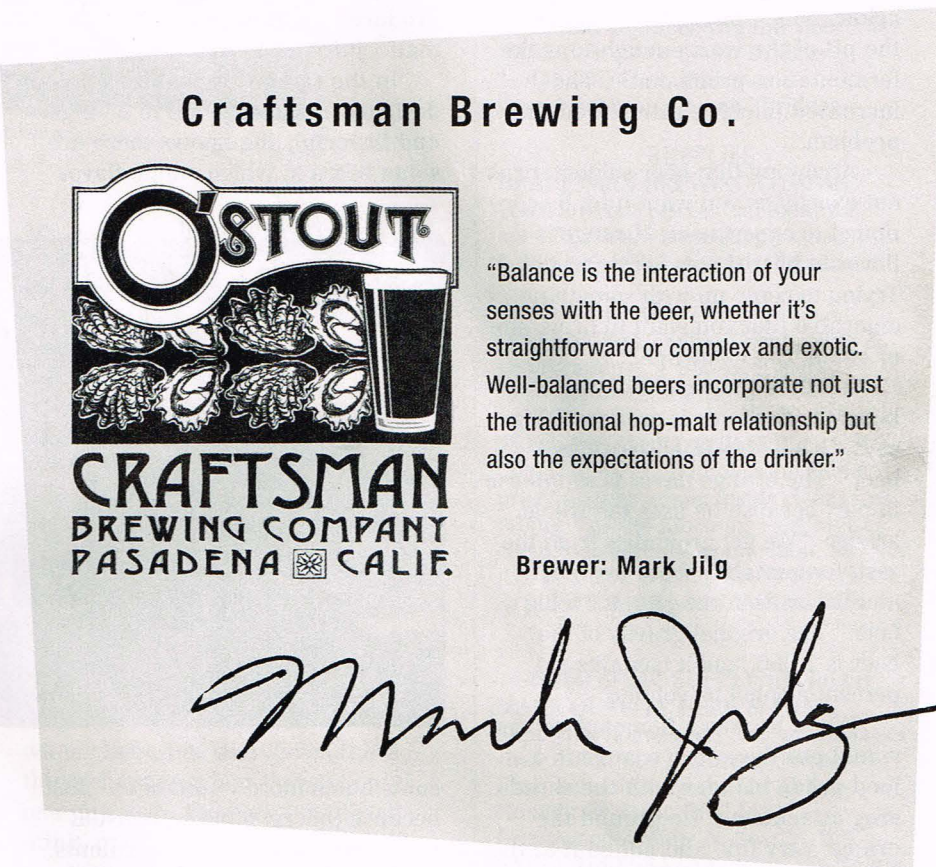
Years of experience: Nine years homebrewing, four professional

House Beers: Buckwheat Brown, Poppyfields British pale ale, Craftsman Rye, Old Town American-style ale

When Mark Jilg was a homebrewer and began experimenting with an orange beer, he knew what he wanted. It should be sweet and tart, just like a glass of orange juice. "The flavor profile was to have upfront the aroma of the orange, some of the bitter, sour effect of when you drink orange juice, and a somewhat sweet finish," he says. He first experimented with orange juice seven years ago, but it was last fall that he created a buzz on the floor at the Great American Beer Festival by introducing those outside Southern California to Orange Grove Ale.

Orange is only one of many flavors that Jilg has introduced into his beer since starting Craftsman Brewing Co. in November 1995. His current lineup also includes beers featuring oysters, spruce, and peated malt. "The art is in coming up with a balance," he says. His beers have varying degrees of flavor from specialty ingredients. The orange, for example, is a lot more assertive than some of the other ingredients he uses.

"It's all about the balance; my desire was to have a beer very forward with the orange. It needs to have substantial orange." Instead of a beer with fruit, Jilg has produced a fruit and beer partnership.



Jilg had been enjoying fresh orange juice from a 50-year-old heirloom orange tree in his backyard and decided that he wanted to add that character to his homebrew.

"I thought, let's marry beer with oranges," he says. "Let's make the malt contribution have a similar sugar content as the orange." And he began experimenting.

The beer with which he started was fairly dry. "But it was lightly hopped. You get the bitterness from the pith of the orange," he says. "The color is as close as you can get to orange with malt, similar to (the color of) a light amber ale." The

grain bill consisted of 80 percent two-row, 15 percent light crystal for color, and 5 percent carapils for residual sweetness. The hops were Northern Brewer (20 IBUs).

The beer was good but needed some adjustments. "It finished too syrupy; it didn't have that refreshing orange-juice intensity," Jilg says. "It was just too sweet and didn't finish dry enough." Also, the yeast didn't attenuate as well as he expected. Because of the orange juice, the yeast strain is important. Jilg began with Wyeast 1056 (American ale). When it failed to attenuate he moved to a more

powdery, higher-attenuating yeast that would tolerate an "orange-laden beer," Yeast Lab Canadian ale yeast.

He also increased the pitching rate, doubling the amount of yeast. "The early brews took a long time," he says. "There was too much lag period." Orange juice is extremely acidic, which might have lowered the pH of the wort enough to make fermentation problematic. The increased pitching rate solved the problem.

Accepting that beer seldom turns out exactly as you want it to, he continued to experiment. "Orange is a flavor in beer that is very unusual. Trying to come up with something enjoyable that you want to drink one or two of is a challenge," he says. "One-fifth of the weight of (the beer's) ingredients is oranges," Jilg says. "It's a very intense orange beer." The orange flavor is so intense in part because he uses the whole orange. "We get aromatics from the zest, fermentables from the meat, and flavor from the pith. It's a big beer." The original gravity of the beer is 1.060, and it contains 6.4 percent alcohol by volume.

When he was a homebrewer he would put the entire orange in a food-grade blender with the shredding attachment. He ground the orange very fine and added it at the end of the boil. At Craftsman he does it exactly the same way.

The Orange Grove Ale contains

Valencia oranges. That's what the tree in his backyard produced, and he has stuck with that variety. "Different oranges have very different flavors. Some have a thick zest and some have a very aromatic outside skin," he says. As it turns out the tree that Jilg has in his yard produces a classic, and very aromatic, juice orange.

In the same way that he designed the orange ale to be big and flavorful, Jilg knows there are some beers in which subtle flavor

its existence but not so assertive that the drinking experience is like being hit over the head with a two-by-four."

Sporting that subtle balance in the flavor profile is another beer he enjoys brewing, oyster stout.

An oyster fan, Jilg wanted to do his part to promote oyster eating in Southern California, especially oysters on the half shell. "Being a brewer, the only way I knew how to do that was to brew a beer featuring oysters," he says. In the



Mark Jilg likes a beer that is a partnership between malt and oranges, instead of beer with orange flavor.

contributes more to the beer. "Just because (beers) have an unusual profile or use unusual ingredients, the beer doesn't have to be screaming at you," he says. "(The flavor) should be assertive enough to justify

tradition of the Irish breweries, he brewed a stout for the opening of oyster season.

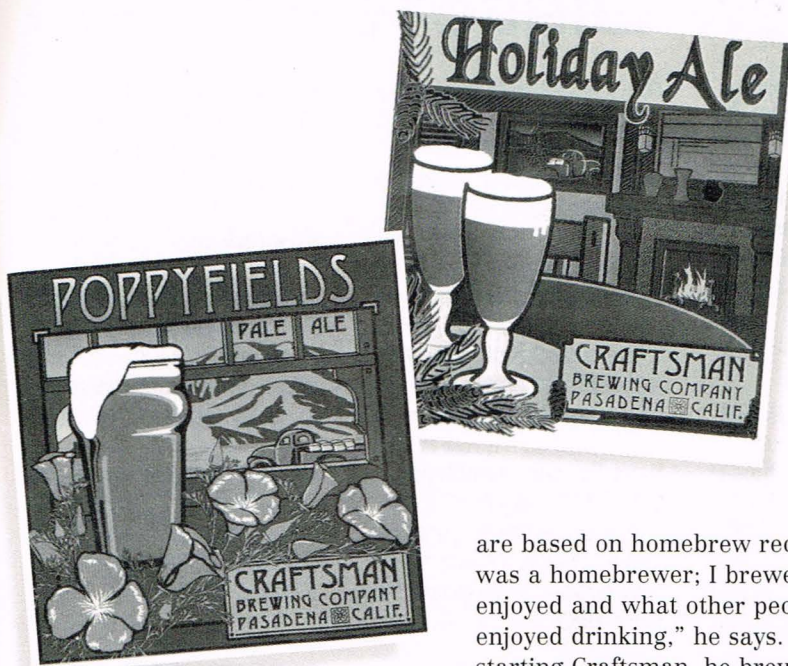
The beer contains oyster shells, but it is designed to be paired with oysters and not taste like them. Instead it is an Irish dry draft style with a dry, mineral quality. Its nitrogenated maltiness goes well with oysters, Jilg says, but it is fairly light with an original gravity of 1.040.

Jilg chooses to use the shell, ground down to powder and mashed in with the grains at the beginning of the mash. "This is one of the most fun beers to brew because the brewhouse smells like the ocean," he says. He's describing the mineral quality in the beer instead of a true oyster taste.

Jilg recommends that homebrewers choose an oyster with a relatively soft shell. Fill a blender one-third full of water and turn it on. Drop in the shell; it should

The Tips

- Experiment with new ingredients to create your own unique recipe.
- Don't make multiple changes in ingredients or process simultaneously or you won't be able to track results.
- Keep detailed notes.
- Look for balance; the off-beat flavor should be assertive but not overpowering.



grind nicely, he says, noting that the blender he used for his early batches is still ticking. He recommends starting with the shells from three oysters (or three half-shells from a restaurant) for five gallons.

Using ground-up shells isn't the only way to go, either, Jilg says. He knows of brewers who use the meat and toss it in at the end of the boil, not only imparting the oyster taste but possibly having an effect similar to that of Irish moss. Jilg does caution that one could go broke this way, especially when brewing by the barrel. Another option is to boil the meat and use the water as a basis for priming sugar. This method, he says, will add the oily, slippery oyster effect.

Whether subtle or aggressive, when you're searching for a specific flavor balance, don't make a lot of changes simultaneously, he says, especially if you are doing a lot of unusual beers. "Keep focused on one attribute you either want to increase or decrease. If you make a bunch of changes, you'll never know which change you made to produce a (given) effect in the finished beer."

And keep consistent notes, he advises. His homebrewing notes have served him well. "When I have an empty cellaring tank I'll drag something out of my homebrew book," he says. The flagship beers

are based on homebrew recipes. "I was a homebrewer; I brewed what I enjoyed and what other people enjoyed drinking," he says. After starting Craftsman, he brewed those same beers.

Buckwheat Brown, Poppyfields British pale ale, Craftsman Rye, and Old Town Ale, an American-style pale ale, are the regulars he serves now. Burly Barleywine, a Scotch isles ale using peated malt, and the Craftsman Holiday Ale, a spruce beer, are the winter seasonals. Orange Grove Ale is available almost year round. This year it was displaced by the introduction of the winter beer, but sometimes these things happen when there is only one guy to do the brewing, distributing, marketing, and creating.

"Someday I'll have an employee," he says, chuckling, but he seems to be having a fine time on his own.

Four years ago when Jilg started Craftsman he was brewing and working full-time for NASA. After a year of that he left to brew and promote the brewery full time. He brewed 200 to 300 barrels last year on his seven-barrel system and hopes to do a bit more this year. "The goal for 1999 is a barrel a day, that's all we ask," he says.

Homebrewing and experimenting will continue as well. "One of my most satisfying times is making a five-gallon batch at home or with friends," he says. "Small pots give you lots of opportunities to be creative." Being a homebrewer should be about brewing what you like, even beer with oranges or oysters. ■

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The Basics of Wine Filtration

by Alison Crowe

Way back when, our enophilic forebears only needed some grapes, a pit, and a few sets of feet to make wine. No crusher-destemmers, presses, or automatic sterile bottlers to mess with. (Of course, the results might have been less than savory.)

These days, home winemakers are lucky to have the benefits of modern technology. The quality of the wine we can make in the comfort of our own homes is a testament to the scope of the equipment and supplies — including stuff once available only to commercial operations — now offered to the home winemaker. Such is the case with filters.

Home winemakers no longer have to endure leftover bentonite chunks, lees, or even bacteria in wine. With the great garage-scale filter products on the market today, wine can be rough filtered to take out some of those pesky bits that will eventually flocculate to the bottom of the bottle. You can even sterile-filter wine and cellar your stash for the winter without worrying about any secondary-fermentation bottle bursts come spring.

For the price of a few good bottles of wine (depending upon your tastes, that is), you can easily add another wine-warrior tool to your arsenal.

Why Filter?

Filtering wine is

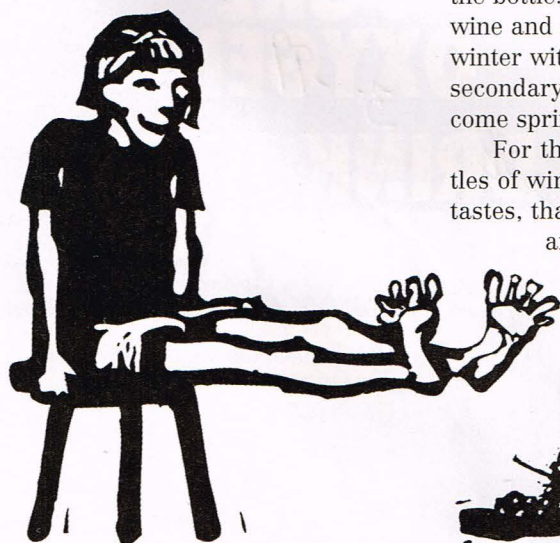
one way to increase its stability and clarity. Commercial wineries filter their wines as an insurance policy; a winery has no idea, once its wine leaves the loading dock, if it'll be gently handled in temperature-controlled trucks or if it will be stuck on the New Jersey Turnpike in the searing July heat.

Along with fining, filtering helps take care of ugly instability problems that can crop up due to secondary fermentation in the bottle or by the grouping of yeast lees or other solids that weren't visible to the naked eye before bottling. Even if, after subsequent rackings, the wine appears clear to you, it probably isn't.

However, with all of the potential benefits of filtering wine, there always are a few dissenters. Many winemakers worry that filtering will strip wine of color. After filtering red wines the filter pads are caked with red stuff, and any logical person would figure that more red stuff on the filter pads means less red stuff in the wine.

Well, science is fickle, and as luck would have it wine is a complex and complicated chemical substance that doesn't hold up to such logic. Red wine's color comes from a number of components that are both colored and colorless. When the wine's balance of colored compounds is thrown off, the colorless components become colored, restoring the balance and letting the wine revert to its original, brightly colored state. This is an area of investigation that is in its infancy, but recent research at the University of California, Davis, shows that the current findings are just the beginning.

The final word on filtering or not seems to be this: If you don't transport your wine anywhere risky,



if you rack it within an inch of its life and then store it in a cool, dark, and temperature-stable cellar, you probably can make good wine without even going near a filter. You don't have to spend the money and time necessary to produce stable, clean, clear wines, but you'll have lots of little goodies in the bottom of your bottles when it comes time to pop them open.

Does It Have to Be Sterile?

There are a couple of grades of filters available to the home winemaker. Depending on the brand of the apparatus, the manufacturer will have filter pads (usually cellulose; they used to be asbestos) that come in either distinct pore sizes (25 micron, 5 micron, 0.45 micron) or grades (rough, polish, and sterile).

Rough filtering is just that, rough. It'll get out the biggest glops of gunk in your well-racked wine (don't even attempt to filter wines that aren't at least relatively clear),

but your wine certainly won't be sterile.

Fine filtering will get smaller particles out of your wine and to a certain extent can help prevent haze formation and bottle fall-out later on. It won't ward off secondary fermentation by a yeast cell or bacteria that got through accidentally.

If you really want to be 100 percent sure that your wine will be sound, stable, and free of yeast and bacteria, sterile filtering is the only way to go. Most commercial wineries do it, and if you're serious about the long-term stability of your product, so should you.

When to Filter

Filtering usually happens after all fermentation (primary and malolactic) and fining (usually gelatin and bentonite) operations have been completed and before bottle aging. In the harvest-time calendar this puts you into early spring. For premium

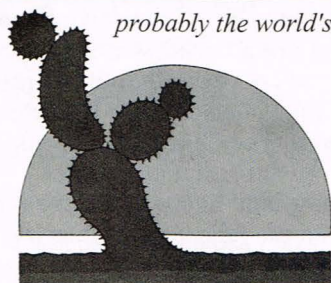
red wines many winemakers fine in January or February after the "crush rush" is over and the wine has had some time to go through a couple of rackings. Then they set up to filter in March or April before they do the year's bottling.

For white wines an ideal schedule is to fine in December, chillproof in January, filter in February, and bottle in April. White wines are ready faster than reds because they have less grape-skin particles, tannin, and anthocyanin to worry about settling out over time.

How Do I Filter?

Filtering is just like any other step in winemaking: messy, wet, and apt to stain your clothes. However, due to newer and easier-to-operate versions of filtering machinery out there, the stains and mess — and the time required — can be minimized.

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purchase the hand models, if you really want to be athletic) and work just like commercial filters do by drawing the wine through a series of sandwich-like filter pads that take out the particles as they pass through.

With most models you basically stick one end of the machine in your full carboy of unfiltered wine, flip the switch, and watch clean wine come out the other end. There might be some "priming" involved (where you let a little wine run through to build up the filter cake) or other steps, but the principle remains about the same. Every model is slightly different, so it's best to follow the manufacturer's guidelines to the letter for best results.

Very popular models among home users and retailers alike are the Buon Vino MiniJet and SuperJet (\$300) electric filters. These filter units are quick, easy to use, and keep oxidation to a minimum, unlike old-style gravity-flow filters,

which were just the opposite. The MiniJet (\$150) is recommended for folks who make wine on a couple-of-carboys scale. The SuperJet (\$300) is best for home winemakers who deal in 60-gallon barrels rather than five-gallon carboys.

There are many other brand names out there, including the Vinamat (a hand-pump filter) starting around \$85 a unit, the Hexter filter at about \$45, and the Flomaster at \$65. As with any major purchase, it's a good idea to do a lot of window shopping, via catalog or on the Web, before buying one.

Equipment also can be rented through homebrew and home-wine-making supply shops.

Be sure to buy the filter and filter pads that are best for the kind of wine you're making and the kind of winemaking philosophy you have. If you don't want to sterile-filter your wine, you don't have to. Buying a bargain-type hand pump for rough

filtering just might fit the bill.

You can filter any type of wine; however, it is more advisable for whites.

Filtering is considered by many to be an "extra" step in the home winemaking process: nice, but not necessary. If commercial winemaking practices are to be considered a home winemaker's weather vane, however, any savvy do-it-yourselfer will notice that filtering is considered not just nice, but critical.

Commercial wineries don't want their hard work and money to be wasted due to haze or burst bottles, and neither should home winemakers. Every drop of your hard-won, prize-winning wine is precious and should be treated as such. ■

Alison Crowe is a graduate of the University of California, Davis, winemaking program and works in the university's Department of Viticulture and Enology.

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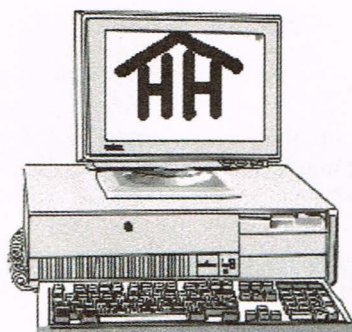
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A Helping Hand for Brewers

With its nearly 300-term searchable brew glossary and large recipe and ingredient databases, the Homebrewer's Helper is a homebrewing resource for all skill levels. The software's reference library contains information on yeast, hops, grains, extracts, adjuncts, and additives. The program also includes an illustrated instructional guide for extract, partial mash, and all-grain brewing, as well as information on homebrewing equipment. In addition to terminology, the brew glossary offers charts, graphs, formulas, and a troubleshooting section.

The Homebrewer's Helper software (Windows 95 compatible) is available in a Deluxe Version (400 recipes) and a Standard Version (200 recipes), with recipes organized by style and brewing method.

For more information call (727) 341-0199 or visit the Web site at www.brewdisk.com.

Conversation Piece: a Brewer's Spurtle

Homebrewers can now take advantage of the mash tool that professional brewers use, the Brewer's Spurtle. Modeled after the Colonial-era "spurtle," a tool for stirring apple mash into apple butter, this paddle-shaped homebrewing tool is a reliable, unbreakable way to mix an all-grain mash.

The spurtle is hand-crafted from Wisconsin maple. The fine grain of the wood discourages residue buildup and allows the spurtle to be exposed to high temperatures without damaging the wood's integrity. The Brewer's Spurtle has a wide-grip handle for control and is available with one or two blade openings. Its length and width can be customized to easily reach the sides and bottom of your mash tun, allowing consistent mixing for predictable results from batch to batch.

For more information call Mon Amie Paddles at (715) 634-7651 or e-mail voyageur@win.bright.net.



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Celebrating the Craft in Craft Brewing

by Sal Emma

Why brew your own? A few years back, the answer was simple: Choice. Especially on the East Coast, there were precious few varieties of beer to choose from in the local taproom or bottle shop. Budmillercoors was about it, save the occasional import that rarely lived up to expectations that matched the price tag.

Brewpubs were a figment of the beer-lover's fancy. All the micros were in the Pacific Northwest, and we had never even heard of most of them, let alone sampled their wares.

With such grim prospects for buying good beer, many of us who had gotten a taste of real beer — overseas or on the West Coast — could either drink the boring stuff or make the good stuff. Making it seemed like a worthwhile option. It was cheap. It was fun. And boy, did the beer taste great.

But things have changed. Big time. The American beer renaissance is bigger and better than many of us would have dared to imagine 10 or 20 years ago.

So why brew your own? Brewing can be a time-consuming, kitchen-destroying, spouse-annoying hobby. It can be frustrating.

Yet we keep at it, in spite of a seemingly endless supply of good commercial beer and the occasional disaster in the home brewery.

Cost plays a role. It's still cheaper to brew than buy, but only in cold cash. When you figure in your time, the cost argument weakens a bit.

The challenge of getting it right keeps some of us coming back. Stick-to-it-iveness is an important character trait of the successful brewer. Evaluating minor, controllable recipe adjustments can take months, even years. Sometimes, it's never *just right*.

But every now and then, you hit the nail on the head. And when that first sip of a newly minted barley-malt masterpiece passes your lips, the effort seems worthwhile.

Sure, you can get beer that tastes as good as yours at the supermarket these days, if you don't mind shelling out the change. But where's the challenge in that? The hard-won battles are the ones that make us savor victory. When you taste your own concoction and it's



CRAM TERRY

Brewing beer allows me to see the world in a unique way.

right — not too hoppy, not too dry, not too sweet, not too grainy, just exactly how you hoped it would be — that's a magical moment.

The Gods of Brewing and Microbiology have smiled on your brewhouse. And you toast the mysteries of life that made your beer possible — and made it so you could taste and enjoy it.

Brewing affirms life. Sure,

dolphins are probably just as smart as we are and they probably enjoy life, too. But we were given the gift of opposable thumbs and a brain to let us dream of forging our physical world into wonderful, mystical things. Like painting, sculpture, music, architecture, movies, books, tuxedos, snowmen, baseball, and beer.

Beer connects us to the world in a way that few other modern endeavors can boast. Driving a minivan to the convenience store to buy a gallon of milk in a plastic jug sort of pales by comparison. Brewing is more like carving a lifelike duck decoy from a block of wood. Like capturing the mist hanging over the river in paint on canvas. Like filling a blank page with words that others want to read.

And more, it connects us to the annals of human history. Beer, after all, is as old as history itself. Philadelphia's Solomon Katz and other scholars have suggested that beer is directly responsible for civilization itself. They suggest that we settled down from our nomadic, hunting-and-gathering lifestyle so we could grow barley for beer. It's an elegant theory.

When we brew, we grab the baton that's been carried by every brewmaster, homebrewer, and alewife who came before us.

Another Philadelphian, Ben Franklin, said "Beer is living proof that God loves us." Well said, Ben old boy. That from a man who knew a thing or two about enjoying life! ■

Sal Emma is a homebrewer and freelance writer in Palermo, N.J. 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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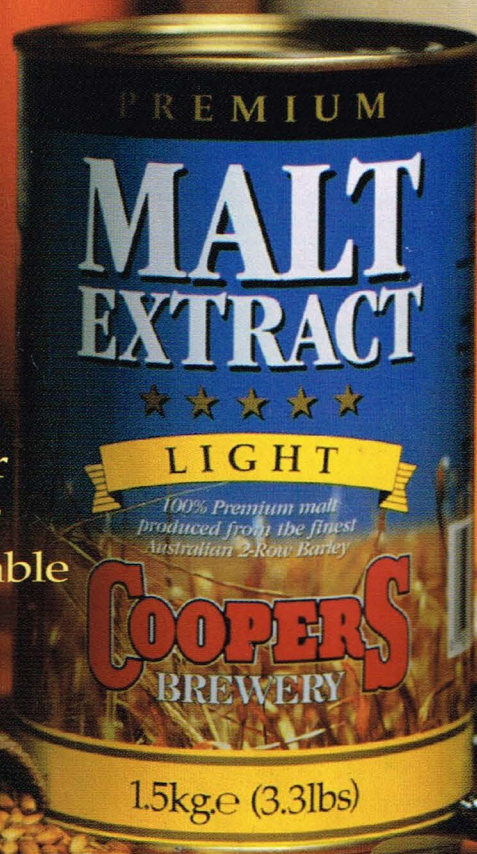
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