

# Brew

Special  
Holiday Issue

DECEMBER 1999, VOL.5, NO.12

THE HOW-TO HOMEBREWER MAGAZINE

## Millennium madness

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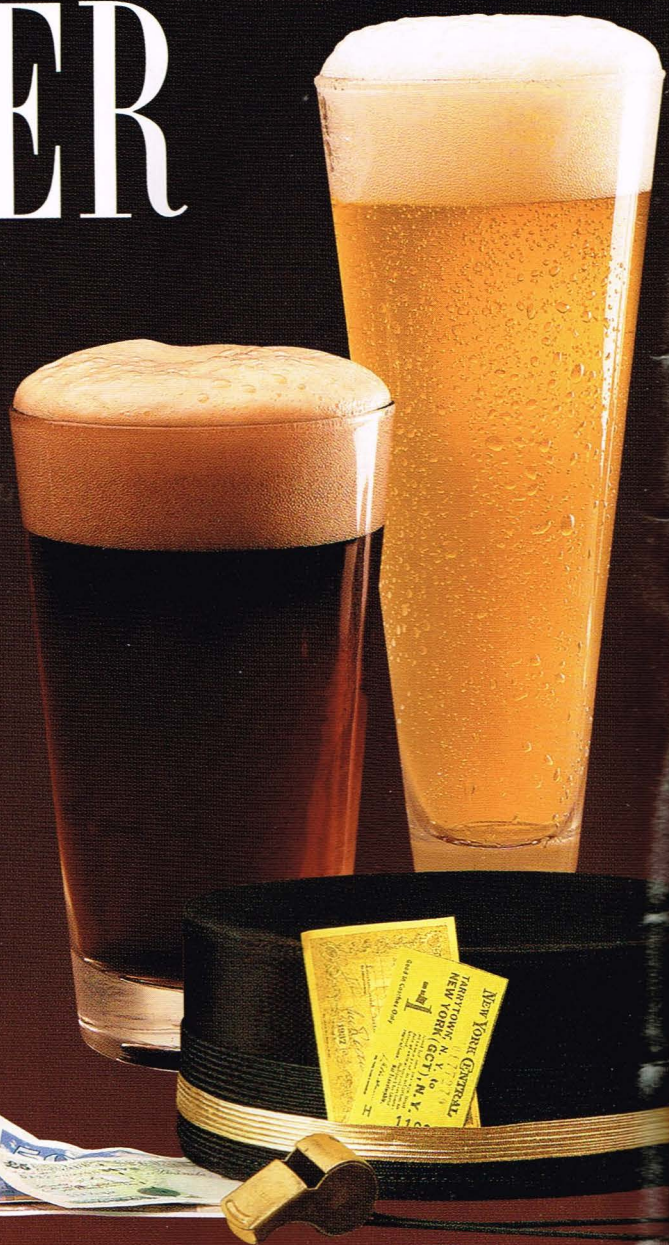
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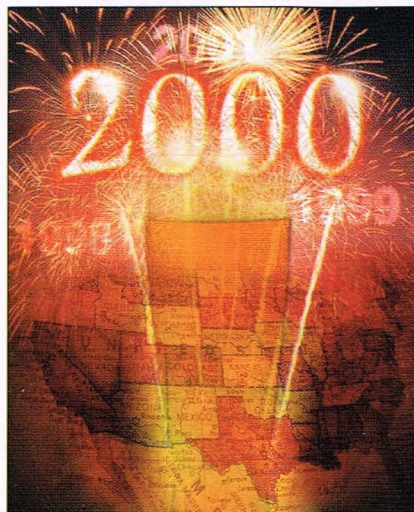


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## Ready to Party

I admit it, I have the millennium bug. Sure, it's overhyped. But hey, what a great excuse to party!

And to you naysayers who purse your lips, shake your heads, and say scornfully that this isn't the real millennium (you know who you are, Gailen Jacobs), I say so what? Let's do it all again next year!

Of course, I once pulled over to the side of the road when my odometer turned to 100,000.0, just so I could enjoy the moment. A quiet time between me and the car that tortured me for years. But that's another story. I also don't mind the fact that instead of having to cross out the last number when I write the year wrong on my checks, I'll have to cross out the whole thing and write it all again. I can handle it.

Anyway, recently I watched a television show purporting to name the "most influential" people of the millennium. What a task! Imagine trying to decide who had the most influence on the world in the past 1,000 years. Number one was Gutenberg, the guy who invented the printing press. Being a magazine editor, I can appreciate that.

But they named 100 people and nowhere did they mention Elvis, Steven Spielberg, or Sean Connery. You're telling me there were 100 people more influential than James Bond? I'm shaken, not stirred! And for you Gen-Xers, no mention of Kurt Cobain or Courtney Love. And where was Cher — singer, comedian, and serious actress? Come on now. We all love Copernicus, but let's have some perspective!

It all made me consider: Who had the most influence on brewing in the past millennium?

We should give credit to Dom Perignon, the monk who, in the pursuit of wine, invented bottle carbonation. And how about Gabriel

Sedlmayer, the brewer to the Bavarian Court who first made Oktoberfest, the beer for the world's greatest party? There's also Louis Pasteur, whose research on microbiology changed our understanding of fermentation.

There are Augustus Busch and Col. Frederick Pabst, who each proved in the late 19th century that commercial brewing could be profitable in the United States. But I prefer Fritz Maytag, heir to the washing-machine fortune who opted to go into the beer business. He almost single-handedly kept the notion of craft brewing alive at Anchor Brewing Co. during the '60s and '70s. In the same vein there's Roger Protz, the British author and beer lover, who helps keep the flame burning for real ale.

Inspired by the brewing greats of the past millennium, this month's issue is dedicated to celebrating the next one (whenever it begins). "A Delicious Way to Celebrate," page 40, helps you prepare for a great New Year's Eve. "Big Brewing for Risky Times," page 26, helps you through the dark days ahead created by the Y2K bug — days when brewers will be popular indeed. And "Cutting-Edge Equipment," page 49, looks at cool new equipment for professional brewers — with an eye toward what that means for homebrewers in the decades ahead.

Enjoy. And don't forget: Party like it's 1999. Hey, shouldn't Prince have been on that list...?

*Craig Bystrynski*

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## Pop's the Question

Dear Brew Your Own,

I just read "Pop Art — Brewing Excellent Soda" (October '99 BYO), and I have a few questions. Why does homebrewed root beer not have a high alcohol content (e.g. it is always less than 0.05 percent)? What is the process? Is fermentation halted before alcohol is produced (but after carbonation is produced)? Or is there another reason?

Megan M. Tommerup  
via e-mail

*Traditional homebrewed root beer relies on a very short fermentation used to produce carbonation and a very small amount of alcohol. This is followed by chilling to halt fermentation and alcohol production. Other methods use artificial carbonation and omit fermentation and yeast, eliminating potential problems with over-carbonation. Both methods are described in the article.*

## Ramstein Blonde Wheat Beer

Dear BYO,

In "5 Signature Beers" (September '99 BYO) the recipe for the 10-gallon batch of the wheat beer calls for two to three gallons of water for the mash. Is this the correct amount or should it be doubled?

Rick Kunstel  
via e-mail

*The amount of water should be doubled. Sorry for the oversight.*

## Brewing on the Trail

Dear BYO,

Cool article on brewing and travel ("Brewing On the Road," October '99 BYO). Last year I vacationed in the Virginia Blue Ridge Mountains near Luray, Va. We ran into this young man backpacking the length of the Appalachian Trail. We shared some commercial brew at the lodge, and he told us about this backpacker he met on the trail brewing his own beer. The young man telling the



story did not know how he did it, but friends met him on the trail to replenish his supply of ingredients along the way.

Michael Delano  
Richmond, Va.

## A Tun of Information

Dear BYO,

I read "Build This Mash Tun for Under \$50" (September '99 BYO) and decided to take the plunge and buy a water cooler for a mash tun. My only problem was how to plug the front of the cooler with minimal work. I also use mini-kegs, and it just so happens that the bung for the top of the mini-kegs fits the opening of the water cooler perfectly. (The bungs from Datograf fit completely into the opening.) Plus, it has just a wide enough opening for a 3/8-inch inner-diameter hose to fit through with no leaks. I can't wait to give it a try. Thanks for giving me the push I needed.

Scott Brekken  
Coppell, Texas

Dear BYO,

I read with interest "Build this Mash Tun for Under \$50." Like the author, I also have cruised Internet sites and spoken with local brewing savants about building my own mash tun. It is clear from the article that the author enjoyed both conceiving and building the mash tun (impressive!). However, for those less inclined but still on a budget, I recommend the same type of water cooler plus a Phil's 9-inch Phalse Bottom (about \$14.95) and a bulk-head converter (about \$10). Without tools or much shopping, you can achieve essentially the same mash tun for less than \$50.

Christopher B. Hopkins  
Miami

*Thanks for the tip. There are several mash-tun conversion kits on the market that can be purchased and easily installed into a water cooler for a reasonable price.*



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# Music to Brew By

**Pete Abbagnaro**  
Wallingford, Conn.

I'm a huge Bruce Springsteen fan, and for some reason I always put on Bruce while brewing. I've seen him live about seven times since 1977, and he epitomizes the hard-working middle class that is the backbone of these United States. His concerts usually last between three and four hours, and he puts on an unforgettable show. He does it without special effects, pyrotechnics, or gimmicks — just pure rock 'n' roll genius.

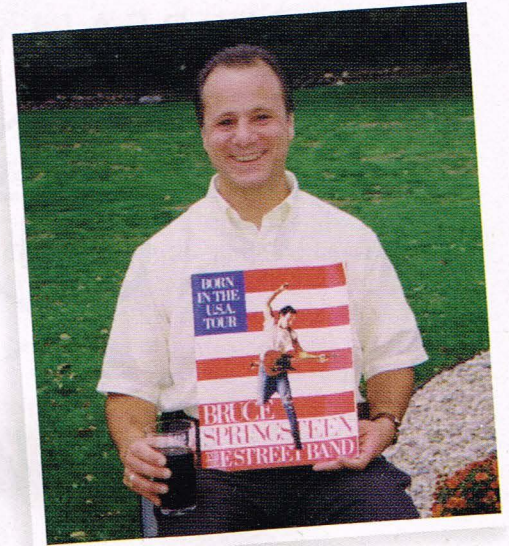
If I really had to analyze why I listen to this truly great rocker while brewing, it's because he inspires me to work hard for a truly good batch of brew.

His music and lyrics psyche me up to the point of frenzy (I know, I went a little overboard here). My heart beats a little faster in

anticipation of the birth of this wonderful liquid. What I really mean by this is that the music inspires me to take the extra steps in the entire brewing process: from cleanliness and sanitization to exact measurements for the malt, water, and hops to stirring the brew after pitching the yeast until my arms are ready to fall off.

I guess it's all about pride. When I present someone with my homebrew, I want them to appreciate my hard work and efforts like I would appreciate a good rock 'n' roll record that Bruce would make.

His songs have always inspired me when I needed a little extra encouragement. His music also inspires me to brew the best five gallons that I can honestly brew. Thanks, Bruce.



*Bruce Springsteen's music inspires me to work hard on every batch I brew.*

**Bob Sturm**  
Palatka, Fla.

Being an old-timer (I'm 66 and on my 154th five-gallon brew), I listen to the music of the '40s and '50s. My wife and I are raising grandchildren, and brewing not only keeps me supplied with my favorite beverage, it also gets me out of the house and away from two teenage boys. I have my own "mini-brewery" in the back yard with a lagering room attached. When I'm brewing and not swinging with the big bands, I listen to the classics on the National Public Radio system of Jacksonville, Fla.



*My band's drummer, Dave Miller (left), and I enjoy a homebrew.*

**Shawn T. Lapierre**  
Pine Valley, N.Y.

I'm in a band, but I brew whenever I can afford to and continue to educate my peers, elders, and myself on the history and existence of this beautiful, bubbly beverage.

## INSPECT YOUR GADGETS!

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# This Beer Is Hot!

by Scott R. Russell

I taught high-school Spanish one year because I needed a job. As a teacher with a degree in French, it pained me to have to teach Spanish, which I have always viewed as a rival for the affections of students and colleagues. Maybe it's professional jealousy. I also had studied Spanish, but it didn't have the same effect on me as French.

Nothing personal against those of you who speak, study, or teach Spanish. I mean no disrespect, but to me teaching Spanish was kind of like being a Red Sox fan and getting a job working for the Yankees. Or vice versa. I felt like a traitor, but

I needed a job, so I taught Spanish for a year.

Much to my surprise, dismay, and eventual amusement, I soon discovered that my second-year students (mostly 15 and 16 years old) had in fact learned only one thing from their previous teacher: They knew the word for beer, *cerveza*. They knew nothing of Cervantes, Garcia-Marquez, Fernando y Isabel, Cortes, Zapata, and the rest. But they knew *cerveza*



(and *por favor*).

Ironically, I have had a similar experience in my French classes, as well.

When we study about the various francophonic countries of the world, someone always discovers that the national beverage of Belgium is *biere*.

Back to Spanish, though. We know how spicy Mexican and Latin American foods tend to be. Which explains the light, bland beers of Mexico; you need lots of them to wash down the spicy food.

This month's recipe is not one

## Cerveza con Chiles (5 gallons, partial mash with spices)

A very simple beer to brew and a pleasantly potent, surprising taste!

### Ingredients:

- 2 lbs. pilsner malt
- 0.5 lb. carapils malt
- 0.5 lb. Vienna malt
- 4 lbs. unhopped extra-light malt extract syrup
- 1.25 oz. (4% alpha acid, 5 AAUs) Hallertauer hops for 60 min.
- 1 qt. lager yeast slurry (I prefer a German pilsner style such as Wyeast 2278, but an American lager strain such as Wyeast 2035 or a California lager strain such as Wyeast 2112 is fine)
- 50 (approximately) very small, dried hot peppers (Ancho, Habañero, Anaheim, or whatever you prefer)
- 7/8 cup corn sugar for priming

### Step by Step:

Heat 1.25 gal. water to 163° F and mix in crushed pilsner, carapils, and Vienna malts. Hold at 152° F for 75 min. Sparge with 2 gal. of 168° F water. Add malt

extract to runnings in kettle.

Total boil is 60 min. Heat to boiling, add hops, and boil 60 min. Top up in fermenter with enough chilled, pre-boiled water to make 5.25 gal. Pitch yeast when wort cools to 70° F.

Ferment in a cool place (50° F) for two weeks. Rack to secondary and condition colder (40° F) for four weeks. Prime with corn sugar and bottle. Place one chile pepper in each bottle before you cap it. Bottle condition for four to six weeks at 40° to 45° F. The pepper flavor will be mild at first, get stronger after a few more weeks, then mellow again and fade with time.

OG = 1.045

FG = 1.008

Bitterness = 20 IBUs

### Notes:

**Peppers:** Take this seriously! If you don't like hot, spicy foods, don't make or drink this beer! The different peppers can contribute very strong, hot flavors, and they will surprise you if you're not

cautious. And don't overdo the dosage; one very small pepper per bottle will be enough — trust me!

If you are worried about sanitization, an hour before bottling you can rehydrate the dried peppers using boiling water. Don't boil the peppers themselves (they will have little or no flavor left if you do). Instead, boil the water and immediately soak the peppers in a covered saucepan for at least 20 to 30 min.

**All-grain:** Mash 5 lbs. pilsner malt, 1 lb. carapils, 1 lb. Vienna malt and 0.75 lb. flaked barley in 2.5 gal. of 152° F water for 75 min. Sparge with 3.25 gal. of 168° F water and proceed as above with boiling (omit the malt extract) and hop addition. Be sure to time your hop addition to reduce your wort to 5.25 gal.

**Extract:** Omit the pilsner malt, but steep the carapils and Vienna malts in 2 gal. of 150° F water for 30 min. Increase the malt extract to 6 lbs. and proceed as above with boiling and hop addition.



of those light, bland beers. Instead, Cerveza con Chiles is for everyone who likes spiciness, savors it, and doesn't just wash it down. Since the spice is in the beer, this is a good beer to accompany those Mexican and Latin American foods that aren't very spicy. A Spanish lesson, then: "*¡Una cerveza mas, por favor!*" (Another beer, please!).

## Reader Recipe

**A.I.S. (American Imperial Stout)**  
(5 gallons, extract with grains)

I brewed this American Imperial Stout in September 1997 to be consumed during the Christmas holidays. I've been told that this jet-black brew with a frothy brown head qualifies as a competition brew! You'll want to sip this one,

although it doesn't have as high an original gravity as traditional Imperial stout.

*Fred Goeldi  
Warren, Mich.*

### Ingredients:

- 4 Tbsp. gypsum
- 1/3 lb. carapils malt
- 0.5 lb. crystal malt, 60° Lovibond
- 0.75 lb. black patent malt
- 1 lb. chocolate malt
- 1 lb. Muntions dry malt extract (plain light)
- 8 lbs. Mountmellick export ale kit (hopped extract)
- 1 cup maple syrup
- 2 oz. Perle whole hops (6.6% alpha acid, 13.2 AAUs) for 60 min.
- 2 oz. Cascade whole hops (6% alpha acid, 12 AAUs) for 30 min.
- 1.5 oz. Willamette whole hops (4.7% alpha acid, 7.1 AAUs) for 5 min.
- 1 tsp. Irish moss
- 0.25 oz. oak wood chips (in secondary)
- 22-oz. starter of Wyeast 1084 (Irish ale)
- 3/4 cup corn sugar for priming

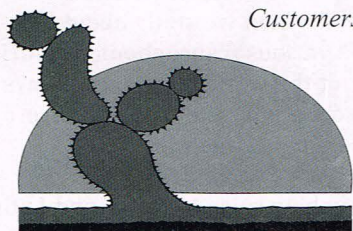
### Step by Step:

In a nylon bag, steep crushed grain in 2 gal. of 150° F water with gypsum for 30 min. Sparge grain with enough 168° F water to make 5.5 gal. Add extracts, maple syrup, and Irish moss. Bring to a boil. Total boil is 60 min. At start of boil, add Perle hops, continue for 30 min., then add Cascades. Continue boil for 25 min. more and add the Willamette hops for the last 5 min. of boil. Whirlpool, cool wort, transfer to primary. Pitch yeast starter.

Ferment at 66° to 68° F for seven days in primary or until gravity is 1.040. Toast oak chips on cookie sheet in oven at 350° F for 20 min. Rack beer to secondary and add oak chips in a nylon bag. Cool beer to 63° F and continue fermenting for seven to 14 days, or until gravity reaches 1.012. Prime, bottle, and age at least three weeks before drinking.

OG = 1.087  
FG = 1.020  
Bitterness = 75 IBUs  
5.9% ABV ■

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# How Fast Is Too Fast?

Mr. Wizard

I have been brewing beer for a little more than a year. I just brewed a batch of all-extract wheat beer, making a starter out of dry yeast and some malt and hops I canned. Primary fermentation got off to a bang and was done in 36 hours or so. Then I racked to the secondary, and there was no action at all. It's as if the yeast is done, but this can't be after only 48 hours, can it? I'm sure I've done something wrong, but I'm not sure what.

John Cleat  
via e-mail



This is a common concern. Usually the brewer assumes a problem occurred when a fermentation plummets with almost unbelievable speed. Although very rapid fermentations might produce beer with a very aromatic nose and a fruity aroma — not always desirable characteristics — they do occur.

The factors most influential in fermentation rate are yeast pitching rate (number of yeast cells pitched), yeast vigor or vitality (health of the yeast cells), yeast viability (percent of cells that are living), fermentation temperature, wort oxygen content and, finally, the yeast strain. You made a starter out of dry yeast.

Even though there is much written about the cons of dried yeast, one of the big pros is that it is easy to properly pitch the wort. Assuming you used a fresh dry yeast packet that contained seven to 14 grams of yeast for a five-gallon batch, your propagation step most likely produced more than enough yeast needed for the job. In other words

you probably overpitched the wort. Furthermore, this yeast probably had excellent vitality and a very good viability. In the fermentation equation lots of living, vigorous yeast cells lead to a rapid fermentation. If you did a good job aerating your wort and the fermentation was conducted at room temperature (about 68° F), a 36- to 48-hour fermentation is not all that unbelievable.

The other major factor in fermentation rate is yeast strain. Certain yeast strains ferment faster than others. The most rapidly fermenting yeast I have ever used is weizen yeast. The last weizen I brewed was a dunkelweizen.

The pitching rate was healthy but not excessive, and the fermentation was conducted at 66° F. When I came into the fermentation room 14 hours following wort cooling, I found foam, yeast, and beer

streaming from the gas outlet of my fermenter. Forty hours following pitching, the primary fermentation was over and the gravity had dropped from 1.050 to 1.008. The beer tastes great — it just got to that point a lot faster than most of my other brews!

Mr. Wizard

I have a question about wort chiller sanitization. I made my own chiller out of 3/8-inch inner diameter copper tubing. I have read that the best way to sterilize a wort chiller is to put it into the boiling wort for the last

15 minutes of the boil. When I do this my boil completely stops, and I have to wait about 10 minutes before the boil restarts. I use my electric stove. Is it normal that the boil stops, or do I need a larger burner? Is there another way to sterilize the chiller?

Bill Johanni  
via e-mail

Using the wort boil to sanitize your wort cooler is really the easiest and most effective method. I feel the same way about interrupting the wort boil and find a 10-minute lull in the boil unacceptable. To ensure that you get the proper boil time, you could simply extend your boil by 10 minutes. This might work for many brews. But if you're adding aromatic hops or spices prior to the 10-minute pause, you might lose some aroma from these ingredients.

Try pre-heating your copper coil before placing it in the boiling wort. If the water line is easy to remove, you could throw it in your oven for a few minutes or put it in a different pot of boiling water to heat it up.

Copper has excellent heat-transfer properties, which means that it doesn't take very long to pre-heat. This is the same reason it does such a great job at stopping your boil.

You could try a larger burner, but you will most likely find that the boil still pauses, because copper absorbs energy from the wort faster than a burner can transfer energy through your stainless steel pot into the wort. This is due to stainless steel's low thermal conductivity and is the reason professional cookware with a stainless steel surface is often clad with aluminum, which does transfer energy well.

If pre-heating is too cumbersome, you could use a chemical sanitizer on the coil. Unfortunately, copper is



easily corroded by many chemicals, especially alkaline compounds such as lye (sodium hydroxide) and bleach. Sanitizers with a low pH such as iodophors and quaternary ammonium compounds ("quats") are much more copper friendly.

**Mr. Wizard**

Last week I brewed a kit barleywine. I pitched the yeast on a Friday afternoon and when I came home on Sunday, the fermentation was so violent I found the airlock on the other side of the room and the lid to my fermenter about three feet away from the fermenter. The person we had feeding the dog said the lid didn't blow until Sunday morning. As best as I can figure, the wort sat for about seven hours without a lid.

I scooped out all of the foam that was exposed to air, cleaned and resanitized the fermenter lid, and then resealed the fermenter and sat it back

in the brew closet. The dog didn't have access to the room where the wort was fermenting. When I resealed the fermenter I added the dry hops, because I lost a lot of the boiling and flavoring hops when I cleared out the foam plug. The wort immediately started sending bubbles through the airlock and continued for about 36 hours.

Do you think the wort was so active that it kept pushing any undesirables out of the fermenter? And by clearing off the top of the foam plug, is there any chance I saved this batch, or am I fermenting a contaminated wort? I really don't want to lose this batch or waste nine months of conditioning when I should be brewing a fresh batch and trying again.

*Michael Leach  
via e-mail*

**B**eer has been fermented in open fermenters for thousands of years. One of the big disadvantages of this method is an increased risk of contamination.

However, many great beers are still made in open fermenters.

In your case you had an active, open fermentation going for a few hours. Since you skimmed the top foam layer before replacing the lid and since actively fermenting beer is less likely to be contaminated from airborne debris than wort or beer that is not fermenting, I wouldn't give up on this batch. Continue with this brew with your normal practices and see what happens. After the beer has been primed and bottled, let it sit for a couple of weeks, then pull a bottle for sampling.

If the beer tastes clean at this point, you probably will be out of the woods. Be careful with excessive aging, because low levels of bacteria can slowly ruin a great beer given enough time. Pull a sample periodically to keep a good check on the batch's progress. Although a barleywine might improve for years, it also can rapidly turn from good to terrible.

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In the past 10 years of homebrewing, yeast has dramatically improved thanks to companies seeing a niche in the yeast supply market. Many of the older books on homebrewing were from an era in which homebrew fermentations slowly plodded along. Such fermentations can be adequately vented from an airlock adopted from the winemaking business.

The "bubbler" airlock used by many homebrewers also is used in the commercial wine industry to vent barrels of aging wine that slowly produce carbon dioxide. This airlock is not designed to vent a large volume of gas over a short time like the gas produced from a primary fermentation, especially when it becomes clogged with yeast, trub, and hop particles! Your accident is evidence of this.

The best device to vent gas from the primary fermenter is a large-diameter tube (3/4-inch to 1-inch) attached to the top of the fermenter, the loose end placed in a small container of water. Brewers who use carboys often find a hose that can be fitted into the top of the carboy without a stopper, thus maximizing the vent size. A large stopper with a fat hose connected to it works better for plastic lids like the one you have.

### Mr. Wizard

I am brewing a batch of wheat beer. I started out my Sunday brewing in my usual fashion of cleaning and sanitizing everything and prepping the whole area for the onslaught. Much to my dismay, I forgot to pre-break my liquid yeast a day before. So I decided to brew anyway, figuring I could pitch my yeast when I got home from work on Monday. I broke the bubble in the package and brewed.

Well here it is Monday night and my yeast has yet to rise. The stamp on the yeast says July 1, 1999. I thought the rule was to wait one day for every month the yeast is beyond its date. Can I pitch the next day if need be?

*Chris Pendy  
Mahwah, N.J.*

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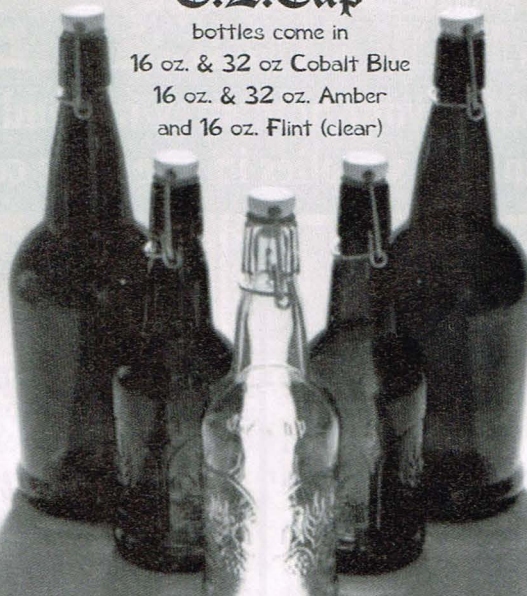
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**S**ome of the best practices I use in brewing were adopted from unforgettable mistakes. When I first began homebrewing my brewing buddy and I ran up against this identical scenario and, like you, we decided to go for it and worry about pitching the yeast when the yeast packet was all plumped up. We brewed, held our wort until the yeast was ready (a day and a half

after wort cooling), and began the fermentation. Luckily, it turned out okay, but the time we waited for that yeast packet to inflate was filled with terrible anxiety.

We figured homebrewing just shouldn't be a stressful pastime. Today I never, ever think about brewing unless I have enough yeast before I mash in. Wort is just too attractive to spoilage organisms

when it is not protected by actively fermenting yeast.

The date stamps on yeast packets really are meant to be used as an indicator. If a day of waiting is required for every month past the date, don't assume only half a day is needed if the yeast is really fresh and pop the yeast the same day you brew. If the yeast was abused during shipping or if the refrigerator at the homebrew supply store is on the fritz, the yeast might require a little extra time to kick into growth gear. The date stamp can't be expected to predict these types of problems.



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### Mr. Wizard

All of my brews so far have been ales. I have found many lager recipes that I would love to try. Without the luxury of a second refrigerator, are there any other ways that I can cold ferment my brew? My basement stays at a very predictable 65° to 70° F year-round.

I have heard of people wrapping their carboys in towels and placing them in large tubs with a few inches of water in the bottom. The towel is supposed to soak up the water and keep the beer cold as the water evaporates. Is this a reliable method? Are there any others that are less expensive and take up less space than a refrigerator?

*Ken Johnson  
Lancaster, Pa.*

**I**n general I like to encourage fellow brewers to experiment and keep an open mind about brewing techniques. With lager brewing, temperature control during fermentation and aging is very important to beer flavor. One of the big flavor differences between ales and lagers is that the level of fruity or estery aromas is typically higher in ales than in lagers.

To produce a clean, crisp lager with a low ester profile, it is not enough simply to use lager yeast. It is also necessary to control the fermentation and aging temperature. Otherwise, a lager fermentation can create ale-like characteristics. Unless you are brewing a San Francisco-style beer such as Anchor



Steam, a lager beer with ale-like properties is not the idea. Lagers should be fermented at 48° to 55° F and can be aged at 32° to 55° F (some brewers age very cold, while others keep the fermentation and aging temperatures the same).

The climate in Lancaster, Pa., is probably similar to Germany, with the exception of warmer summers. The traditional lager breweries in Germany only brewed during the cooler seasons. If you have a garage, you could brew lagers all winter. Instead of refrigerating your lager, you could make a small, heated box to protect against cold Pennsylvania nights. But be careful not to oversize the heater. And if you use a light for heating, protect your fermentation from the light.

The wet blanket method also works, but if your basement is 65° to 70° F, you won't be able to keep the temperature cool enough through evaporative cooling alone. Some brewers use this method accompanied with ice in the tub. This technique works but requires a lot of attention and can easily over-cool the fermentation.

Certain ale strains are known for producing very low ester levels and for their ability to tolerate fairly cool temperatures, down to about 58° F. These strains can be used to brew ales with aroma profiles similar to lager strains. Given your basement temperature, you might want to brew a lager recipe with an ale strain and keep the fermentation around 60° F with the wet blanket, evaporative cooler plan. ■

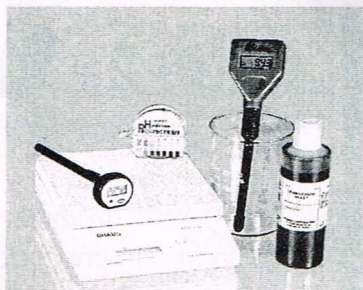
### Mr. Wizard's Address

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.

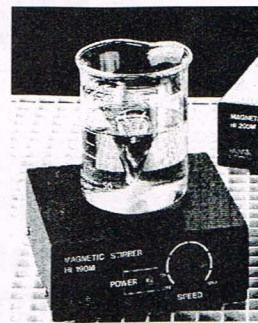
*Mr. Wizard, BYO's resident expert, is a leading authority in homebrewing whose identity, like the identity of all superheroes, must be kept confidential.*



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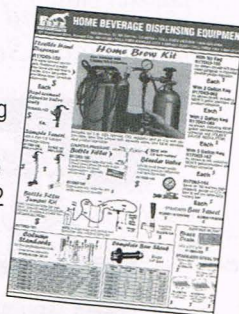
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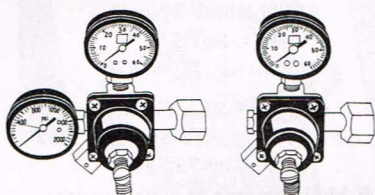


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## Brews to End the Season

by Mikoli Weaver

**W**e have finally reached the end of the brewing schedule for 1999, and we will bring everything to a finale with a highly hopped Christmas ale and an old ale.

The cellar should be looking pretty good after a year of brewing recipes from the Style calendar. The barleywine is ready for New Year's Eve, some imperial stout is still around (hopefully), the Oktoberfest and maibock are still good, the porter is great, and the doppelbock should be shaping up nicely. If any Scottish ale, framboise, hefeweizen, or Belgian tripel remain, you should consume them; they do not age well.

This month's brewing schedule has been planned around the holidays. But if you travel at this time of year, you might need to come up with your own schedule.

### Old Ales

Old ales are strong, almost always dark ales that are sometimes

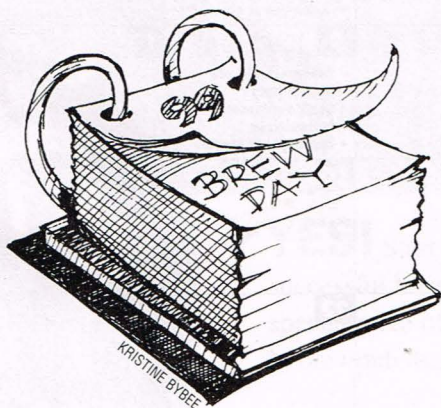
known as strong ales. They are English in origin and range from the Eldridge Pope brewery's famed Thomas Hardy's ale, which at 12 percent alcohol by volume is considered part strong ale and part barleywine, to Young's Winter Warmer at 5.2 percent. From just these two examples you can see the diversity within the category of old ales.

Although Hardy's and other very high-gravity, cellaring-type beers are the exception, the rest of the field take their cue from them. Most old ales are highly hopped for balance, and many contain 6 percent alcohol by volume or more. If properly bottle conditioned, these strong ales can age for extended periods. Many manufacturers of this style use the titles "old" and "strong" interchangeably. There seems to be a fairly reliable distinction between some classic examples, however.

The style guidelines for old ale are: original gravity 1.055 to 1.126 (13.75° to 31.5° Plato), final gravity 1.010 to 1.040 (2.5° to 10° Plato), bitterness 24 to 80 IBUs, color 10° to 80° SRM, and alcohol by volume 5.3 percent to 11 percent.

As you can see, the category is fairly open to interpretation, allowing the brewer to create almost anything to fit the style. To perfectionists, this presents a problem. Style guidelines for color and bitterness are wide open, so the only numbers that make this beer an old ale are the high gravity and alcohol.

Our old ale will be in the middle of the style guidelines, with a target original gravity of 1.080 (20° Plato), bitterness 40 IBUs, alcohol by volume at 8.7 percent, and final gravity of 1.012 (3° Plato). Color will be at least 80° SRM, or black with some deep reds if held up to bright light.





## Brewing Schedule Notes

### Dec. 2, Thursday Prep day for Christmas ale

Assemble all ingredients for Christmas ale, sanitize equipment, and start yeast culture for brewing on Saturday.

### Dec. 4, Saturday, Brew day

Brew Christmas ale, record original gravity, and begin fermentation at 69° F for seven days.

### Dec. 9, Thursday Prep day for old ale

Assemble all ingredients for old ale, sanitize equipment, and start yeast culture for brewing on Saturday.

### Dec. 11, Saturday, Brew day/transfer

Brew old ale, record original gravity, and begin fermentation at 67° F for seven days.

Rack Christmas ale to secondary, dry hop, and record gravity. Continue for seven more days at 69° F.

### Dec. 18, Saturday Transfer/bottle

Transfer the old ale to secondary and continue fermenting for seven days.

The Christmas ale should be done fermenting and ready to bottle today. Age at least seven more days before drinking (Pop the top on December 25, Christmas Day).

### Dec. 27, Monday Bottle old ale

The old ale should be done today and ready for bottling. If gravity has not fallen to 1.012 (3° Plato), give it another couple of days. Age for at least two more weeks (January 10).

### Dec. 31, Friday

Barleywine from January 1999 is ready to drink!

**January brews:** Barleywine 2001, Roggenbier (German rye).

Semantically there are many strong ales in production, but just because a beer happens to have a high alcohol content does not mean that it should automatically be classified as an old ale. In general old ales should be classically English in ingredients and character and for the most part be dark, rich, alcoholic ales.

## Formulation — Malt

Many traditional ales of very high gravities, say more than 1.072 (18° Plato), are produced by separating the run-off into first and second runnings. This is sometimes known as parti-gyle brewing. It means that the first part of the run-off is collected for the stronger ale, and the end portion of the wort is used for a weaker or "small" beer.

That will not be the method used here, as a specific recipe is given for our old ale. But you can easily practice the technique if you are brewing several successive brews close together (preferably of the same type). For example a porter recipe could become a stout (by the first runnings) and a brown or mild (by the second runnings).

## December 1999

| SUNDAY | MONDAY                                                                                                                              | TUESDAY | WEDNESDAY | THURSDAY                                                                                                           | FRIDAY                                         | SATURDAY                                                                                                       |
|--------|-------------------------------------------------------------------------------------------------------------------------------------|---------|-----------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|        |                                                                                                                                     |         | 1         | 2 <b>PREP DAY</b><br>• Assemble Christmas ale ingredients<br>• Soak equipment in sanitizer<br>• Make yeast starter | 3                                              | 4 <b>BREW DAY</b><br>• Brew Christmas ale<br>• Primary fermentation starts; check original gravity and record  |
| 5      | 6                                                                                                                                   | 7       | 8         | 9 <b>PREP DAY</b><br>• Assemble old ale ingredients<br>• Soak equipment in sanitizer<br>• Make yeast starter       | 10                                             | 11 <b>BREW DAY</b><br>• Brew old ale<br>• Primary fermentation begins<br>• Transfer Christmas ale to secondary |
| 12     | 13                                                                                                                                  | 14      | 15        | 16                                                                                                                 | 17                                             | 18 <b>TRANSFER</b><br>• Rack old ale to secondary, check and record gravity<br>• Bottle Christmas ale          |
| 19     | 20                                                                                                                                  | 21      | 22        | 23                                                                                                                 | 24                                             | 25 <b>DRINK</b><br>• Christmas ale ready to drink                                                              |
| 26     | 27 <b>BOTTLE</b><br>• Sanitize bottles and bottling vessel<br>• Record final gravity<br>• Rack, prime, bottle<br>• Age 2 more weeks | 28      | 29        | 30                                                                                                                 | 31 <b>DRINK</b><br>• Barleywine ready to drink |                                                                                                                |



Thus a five-gallon recipe for your normal porter could yield two 2.5-gallon batches of the others. Most brewers only choose to use the parti-gyle system with very high gravity beer to conserve the end runnings, leaving ales of more ordinary gravity to the common brewing method.

This brings up another problem with mashing high-gravity beers and any beers with a great deal of grain: the size of the mash tun. Many homebrewers do not have a mash tun large enough to make five gallons of beer at a gravity higher than 1.072 (18° Plato). Anything larger tends to be overpacked, which leads to cool spots and poor extraction, not to mention a difficult run-off procedure because the mash tun is so full. In this case it is best to brew two half batches and blend them in fermentation.

## Hops

Like any other English beer we brew, the hops for old ale should be of the U.K. variety. Kent Golding, Fuggle, Bramling Cross, Challenger, and other hops are all good selections. Typically Style of the Month recipes employ a Fuggle and Golding hops program. But this beer demands a bit higher bittering potential from early and middle hop additions, so Bullion has been chosen for that purpose, and Kent Goldings will finish the beer.

## Fermenting High-Gravity Beers

There are several things to consider when fermenting high-gravity beers of all types. The first and perhaps most important is the yeast strain you will be using. Since this beer has an original gravity of only 1.080 (20° Plato), yeast strain really should not be an issue. But higher gravities can kill yeast (because the alcohol content gets so high).

Alcohol is a waste product to yeast and is toxic, and with high concentrations the yeast cells actually begin to die as a matter of osmotic pressure as the water inside tries to move to higher concentration. Depending on the yeast strain, it takes an alcohol content of

anywhere from 7 percent to more than 12 percent to harm the yeast.

Choosing an alcohol-tolerant yeast is important, but there are several other ways to counter the outcome. For example you can pitch more yeast partway through fermentation, rousing with more oxygen, and even pitching a second type of yeast for finishing.

For our purposes the yeast

recommended in the recipe (Wyeast 1098, British ale; or try White Labs WLP005, British ale) will work great, but it needs to be oxygenated as much as possible. That means if you have a stone for oxygenating, let it rip. And if you don't have one, well, shake that carboy until your arms fall off.

If everything goes as planned, the fermentation should be finished



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in two weeks and should be starting to clear a bit after three weeks.

## Comparisons

Beside the Young's and Hardy's old ales stand a variety of other old ales to try before brewing. Imports include Fuller's 1845 and the legendary Theakston Old Peculier. Domestically, try Pyramid Snow Cap Ale and Dogwood Winter Ale

(which is a darker black, like our old ale).

## Happy Holidays, Hopheads

Over the past several years there has been a trend for brewers to release potent, highly hopped beers as holiday seasonals. This is really a treat for those of us who miss the multiple IPA handles that fade with summer

passing into fall.

So for our seasonal we will be having a "July in Christmas," you might say. Much of this Christmas ale will relate to a standard IPA; in fact it will be an IPA, with the addition of some roasted specialty grains in the grist to create a deeper, richer, more warming beer.

## Inspiration

Many West Coasters are familiar with Sierra Nevada Celebration Ale, a much anticipated winter seasonal each year. It is a beer with a deep amber color and lots of alcohol esters and malt character.

Other beers from around the country that are created in the same mind-set as the Sierra and our Christmas ale are Goose Island Christmas Ale (although not as bitter as others), and Boulder Igloo Ale. This is essentially what we are trying to do with our Christmas ale: create a warming IPA style with a little extra everything.

## Yeast Strains and Fermentation

The feel of this beer is going to be very American. The hops are two great American varieties, and the yeast is Wyeast 1272 (American ale II).

It is almost exactly like Wyeast 1056 (American ale) but the flocculation is better, so bottle conditioning and a couple of days in the refrigerator (or snow bank, depending on the weather in your area) before drinking will produce a nice, clear beer, if it's poured carefully.

The character of the yeast will work perfectly with the pronounced hop flavor and high bitterness as well as the complex malt flavors from the abundant caramel and toasted grains. Alternatively, try White Labs WLP001 (California ale) yeast.

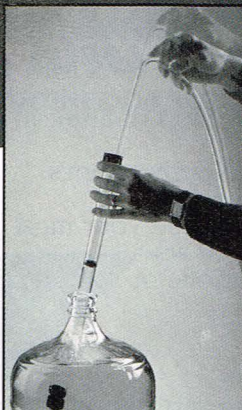
As a lager, this beer is really good with Wyeast 2035 (American lager). It takes a bit of extra aging but is phenomenally smooth and clean when finished. White Labs WLP810 (San Francisco lager) is another good yeast to try for fermenting the Christmas ale as a lager.



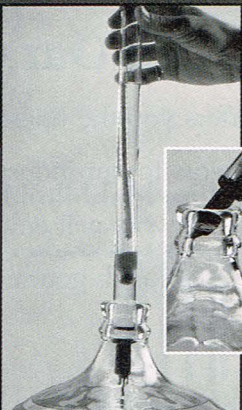
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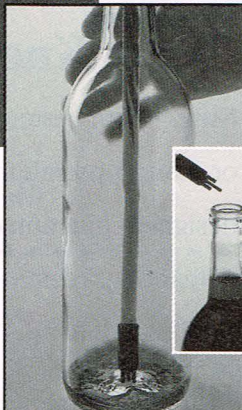
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## Fermtech Ltd.

CIRCLE 22 ON READER SERVICE CARD



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

### Ingredients:

- 11.75 lbs. English two-row malt such as Beeston Maris Otter
- 0.5 lb. carapils or dextrin-type malt
- 2.5 lbs. crystal malt, 80° Lovibond
- 0.25 lb. chocolate malt

- 0.25 lb. roasted barley
- 1 oz. Bullion hops (8% alpha acid, 8 AAUs) for 90 min.
- 1.25 oz. Kent Golding hops (5.4% alpha acid, 6.8 AAUs):  
0.75 oz. (4.1 AAUs) for 30 min.,  
0.5 oz. (2.7 AAUs) at end of boil
- 1 pt. yeast starter of Wyeast 1098 (British ale)

- 2/3 cup corn sugar for priming

### Step by Step:

Mash grain in 4.75 gal. of 150° F water for 60 min. Sparge with enough 168° F water to yield 5.75 gal. of wort.

Total boil time is 90 min. At beginning of boil, add Bullion hops and boil 60 min. Add 0.75 oz. Kent Golding hops and boil 30 min. more. At end of boil, add remaining Kent Goldings. Whirlpool and cool to 69° F to pitch starter.

Ferment at 69° F for seven days, then rack to secondary fermenter. Continue fermentation for seven more days until gravity is about 1.012 (3° Plato). Prime and bottle. Age at least two more weeks before drinking.

### Extract With Grains Option:

Substitute 9.5 lbs. pale malt syrup for pale malt. Specialty grains remain the same as above. Start with 5 gal. of water in boil kettle.

## 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. A beer with 42 IBUs is very bitter.

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

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Steep crushed grain at 150° F for 30 min. Remove bag and rinse with enough 168° F water to make 5.5 gal. Add extract. Total boil time is 60 min. At beginning of boil, add 1.25 oz. Bullion hops and boil 30 min. Add 0.75 oz. Kent Golding hops and boil 30 min. more. At end of boil add remaining Kent Goldings. Whirlpool and cool to 69° F to pitch starter. Follow fermentation schedule for all-grain version.

OG = 1.080 (20° Plato)  
Bitterness = 40 IBUs  
Color = 80° SRM  
8.6% ABV

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

#### Ingredients:

- 10.5 lbs. pale two-row malt
- 0.5 lb. carapils or dextrin-type malt
- 1.5 lbs. crystal malt, 20° Lovibond
- 0.5 lb. biscuit malt, 25° Lovibond

- 0.25 lb. brown malt, 50° Lovibond
- 1 oz. Columbus hops (13% alpha acid, 13 AAUs) for 90 min.
- 2.5 oz. Liberty hops (4.5% alpha acid, 11.25 AAUs): 1 oz. (4.5 AAUs) for 30 min., 1.5 oz. (6.75 AAUs) for dry hop
- 1 pt. starter of Wyeast 1056 (American ale)
- 3/4 cup corn sugar for priming

#### Step by Step:

Mash grain in 4.25 gal. of 150° F water for 60 min. Sparge with enough 168° F water to collect 5.75 gal. of wort.

Total boil time is 90 min. At beginning of boil, add Columbus hops and boil 60 min. Add 1 oz. Liberty hops and boil 30 min. more. Whirlpool and cool to 69° F to pitch starter. Oxygenate/aerate well.

Ferment at 69° F for seven days then rack to secondary fermenter. Add remaining Liberty for dry hopping and continue fermentation for seven more days until gravity is

about 1.008 (2° Plato) or fermentation is finished. Let settle, rack, prime, and bottle. Age at least seven more days before drinking, preferably 14 days.

#### Extract With Specialty Grains Option:

Substitute 8.75 lbs. pale malt extract syrup for pale malt. Specialty grains remain the same as above. Start with 5 gal. of water in boil kettle. Steep crushed grain at 150° F for 30 min. Remove bag and rinse with enough 168° F water to make 5.5 gal. Add extract. Boil time is 60 min. At beginning of boil, add 1.25 oz. Columbus hops and boil for 30 min. Add the Liberty hops and boil 30 min. Whirlpool and cool to 69° F. Pitch starter and follow fermentation/dry-hop schedule for all-grain version.

OG = 1.068 (17° Plato)  
Bitterness = 60 IBUs  
Color = 15.5° SRM  
7.5% ABV ■



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CIRCLE 12 ON READER SERVICE CARD



# Reinheitsgebot

## Behind the German Beer Purity Law

by Sal Emma

The *Reinheitsgebot*, the so-called German purity law, might just be the most celebrated manufacturing regulation in the world.

As it is most commonly expressed, the *Reinheitsgebot*

(*Rine-heights-ge-boat*) states that only water, barley malt, hops, and yeast may be used in the brewing of beer.

But the truth is the *Reinheitsgebot* says both more and less than that. It's a bit like Hamlet's famous soliloquy. Everyone knows "To be or not to be," but what's he really getting at, anyway?

The *Reinheitsgebot*, in fact, is a 500-year-old piece of history that, beyond the surface, tells us much about the times in which it was written.

### Common Usage

One thing is certain. Advertising copywriters love the *Reinheitsgebot*.

You've read it in a gazillion places, in ads, labels, Web sites, and six-pack holders, something along the lines of:

"Schmermbaum beers are among the finest brewed in the world. You can count on Schmermbaum quality, freshness, and taste — every glass, every bottle, every case. That's because all Schmermbaum beer is hand-crafted to the exacting standards of the *Reinheitsgebot*, Germany's centuries-old beer purity law."

But the actual law itself is conspicuous by its absence in most of the places that sing its praises.

There are a few reasons for that. First, the *Reinheitsgebot* isn't really about beer quality. In fact beer quality is secondary to the main idea, which is price regulation. The law is billed as the world's "oldest consumer protection law." This point has merit, considering the fact that the *Reinheitsgebot*, which was officially decreed in 1516, survived in one form or another from 1493 to 1987!

It's true that the *Reinheitsgebot*

### Reinheitsgebot

We hereby proclaim and decree, by Authority of our Province, that henceforth in the Duchy of Bavaria, in the country as well as in the cities and marketplaces, the following rules apply to the sale of beer:

From Michaelmas to Georgi, the price for one Mass or one Ropf, is not to exceed one Pfennig Munich value, and from Georgi to Michaelmas, the Mass shall not be sold for more than two Pfennig of the same value, the Ropf not more than three Heller.

If this not be adhered to, the punishment stated below shall be administered.

Should any person brew, or otherwise have, other beer than March beer, it is not to be sold any higher than one Pfennig per Mass.

Furthermore, we wish to emphasize that in future in all cities, markets and in the country, the only ingredients used for the brewing of beer must be Barley, Hops and Water. Whosoever knowingly disregards or transgresses upon this ordinance, shall be punished by the Court authorities' confiscating such barrels of beer, without fail.

Should, however, an innkeeper in the country, city or markets buy two or three pails of beer (containing 60 Mass) and sell it again to the common peasantry, he alone shall be permitted to charge one Heller more for the Mass of the Ropf, than mentioned above. Furthermore, should there arise a scarcity and subsequent price increase of the barley (also considering that the times of harvest differ, due to location), We, the Bavarian Duchy, shall have the right to order curtailments for the good of all concerned.



was a consumer protection law. But its authors were more concerned with the price of beer than with its quality, and for a very specific reason.

Because beer was taxed, the more beer produced, the more tax money the Duchy could collect. The more beer the people drank, the more beer was produced. And so on. Not unlike products of today's industry/regulator relationships, the Reinheitsgebot was conceived as a cooperative regulation between the brewing industry and the government to promote beer drinking in general and to keep it affordable. Now that's a law we can live with!

But what about that "purity of ingredients" thing? You know, barley, water, hops? That old Reinheitsgebot saw that requires brewers to use only very specific ingredients. You are likely to miss that bit about ingredients if you read it quickly.

There is no mention of malt. Nor of yeast. The latter is easily explained. The Reinheitsgebot was written before the great scientists of the 19th century, Pasteur among them, discovered and identified yeast. The lack of the word "malt" in the law is not so easily explained. Most scholars agree that it was inferred in 1516. The law was later amended to include the word "malt." More on that later.

### The Bread Connection

By mandating that beer be brewed with barley only, the Reinheitsgebot made *weissbier* illegal contraband — and weissbier brewers enemies of the state, as it were. It is possible that the Reinheitsgebot had more to do with bread than beer. With the code, the Duchy saved the wheat and rye fields for flour, ensuring that there would be enough bread to meet demand.

This seems rather anachronistic

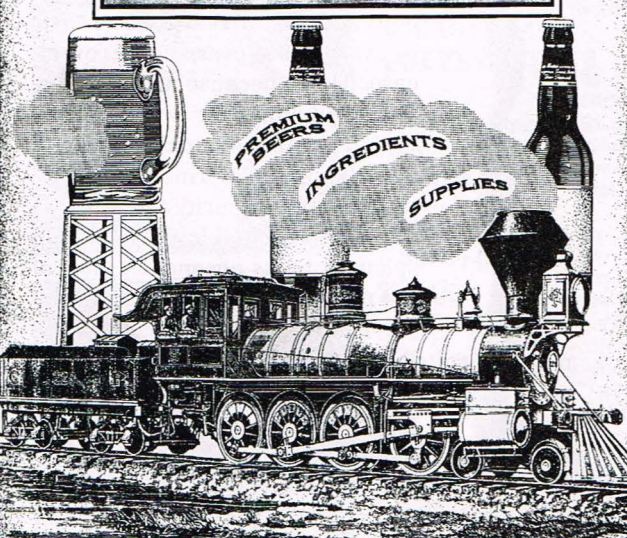
today, but it is not too unlike current food labeling laws that require "mayonnaise" be made with eggs and "ketchup" be made with tomatoes. It also can be seen as an attempt at managing the agricultural output of Bavaria at the time, to make best use of the available resources for the common good.

### The Weissbier Connection

Then again, there is another, more cynical theory associated with the Reinheitsgebot's wheat ban, one that reeks of the elitism of aristocratic power.

As a homebrewer, you know how challenging it can be to keep your beer pale. Beer in its natural state is dark: brown, black, or red. So it was in 16th-century Bavaria, before the art of making pale Pilsner beers was perfected in neighboring Bohemia. Even the bottom-fermented beers of the day were pretty dark, as a rule.

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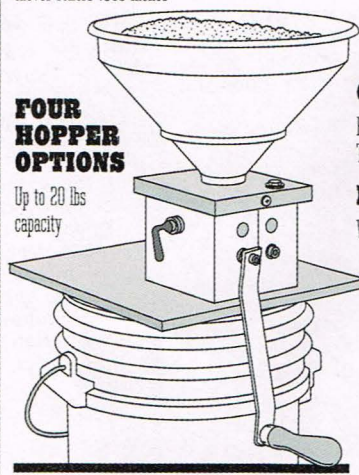
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But the brewers knew a secret: When wheat was added to the grist bill, the resulting beer was pale, light, crisp, and very refreshing.

In their desire to possess all the finest things of science and art, the Bavarian aristocracy went crazy for the "white" beer. Perhaps a little too crazy.

The Reinheitsgebot prohibited the private brewers from making weissbier — leaving an opportunity for the nobility and the clergy to monopolize its production. Evidence for this assertion can be found in the history of weissbier during the period. By 1600 or so, all of the known weissbier breweries were controlled by nobles or monks.

Weissbier brewing spread from one royal court to the next, from cloister to cloister, keeping up with demand among the nobles. All this time, of course, the great unwashed were swilling their dark barley beer, so the story goes. The Reinheitsgebot might have ensured that there was enough wheat for bread and the nobles' white beer.

In time the weissbier craze faded among the nobles, and the language of the Reinheitsgebot was changed to allow wheat in the breweries. Wheat beer became just another style that was legal for the commoner to enjoy.

### **The Biersteuergesetz**

The Reinheitsgebot is not, strictly speaking, a beer purity law. Drinkability and sanitation were not the issues that led to its draft. So what about this notion of the Reinheitsgebot brewer carefully crafting his beer to exacting, government-supervised, violators-be-banished standards?

Enter the *Biersteuergesetz*, Germany's Beer Tax code, which was the form of Reinheitsgebot in effect until a 1987 court case. It is generally agreed that the Reinheitsgebot fathered the code — and influenced both its language and spirit.

The Biersteuergesetz is more specific to beer production than

the original Reinheitsgebot and certainly more detailed in its requirements:

- Only barley malt, hops, yeast, and water may be used for the brewing of bottom-fermented beer (lagers). Exceptions are made for hop powders and extracts, as well as fining agents that have no effect on the taste, odor, or color of the beer.

- For top-fermenting beer (ales), other malts may be used. Also, pure cane, beet, and invert sugars as well as dextrose and coloring agents derived from these sugars are allowed.

- Exceptions to the ingredients rule are allowed on a case-by-case basis, particularly for specialty beers and beers intended for export.

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- Homebrews are expressly exempted from the ingredient rule.

The Biersteuergesetz continues with specifications for experimental beers and brews of unconventional strength. It also prescribes special procedures for maltsters.

The code is light years ahead of its simplistic ancestor. It allows for removable finings, hop extracts, non-barley malts, sugar, and yeast.

But again, the law falls short of true quality control. Unlike modern quality assurance schemes, it ignores beer's fifth ingredient: bacteria. Because only the word "yeast" is used, bad yeast also is ignored. Technically speaking, a beer contaminated with both *Lactobacillus* bacteria and *Saccharomyces diastaticus* spoilage yeast could be okay according to the

code but undrinkable to the imbibor.

Which leads to the inevitable question that might make the ad copywriters squirm: Does the Reinheitsgebot or any of its modern progeny mandate good beer?

The simple answer: no.

Just as buying the best golf clubs won't make you a good golfer, the Reinheitsgebot can't make you a good brewer. You could follow the Reinheitsgebot and still make some pretty terrible beer or even some really bland and boring stuff. Let's face it: there are more than a few unremarkable mass-marketed beers — European ones mainly — that are made to Reinheitsgebot standards.

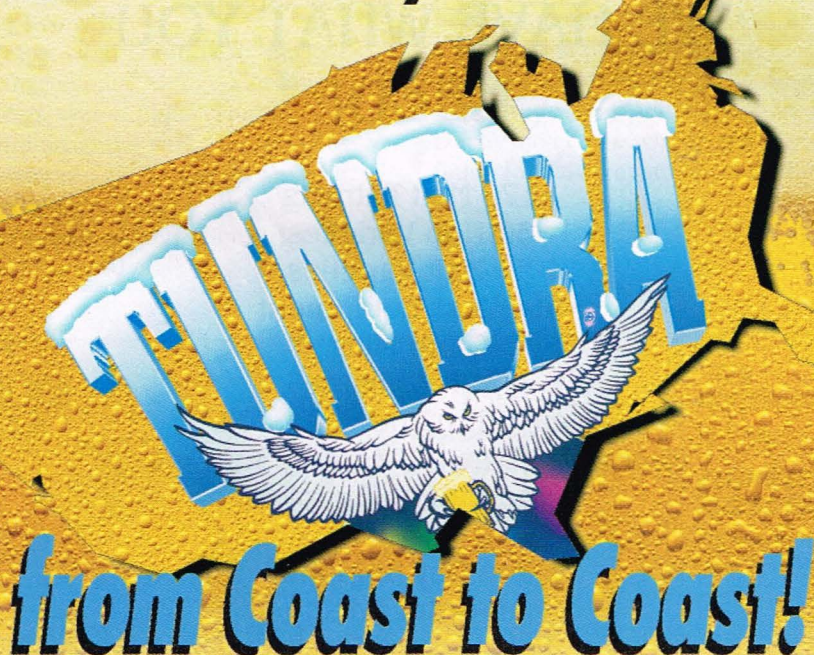
But the tradition of the code has staying power. The European Court struck down the law as a barrier to trade in 1987. In spite of this historic decision, foreign beers have made few inroads in the German market. The Germans love their beer — and their Reinheitsgebot. Most brewers continue to brew according to the code — and foreign brewers have even reformulated their recipes to follow the Reinheitsgebot. The Guinness Stout sold in Germany, for example, is much different than that sold in Dublin. It's made with all Reinheitsgebot-approved ingredients, even though the law has been off the books for more than a decade!

Perhaps the law survives because of its spirit. Michael Jackson in his *New World Guide to Beer* (Running Press) sums it up nicely:

"The law is antique and so has its faults. But it does have the merits of being very simple and based on a sense of beer as an honest product — pure and wholesome, too...The law itself could not ensure that all brewers would have skill, flair, and sensitivity, but in no corner of the world has as much good beer been made than in Bavaria."

Reinheitsgebot or no, German brewers are and have always been among the world's best. No argument there. ■

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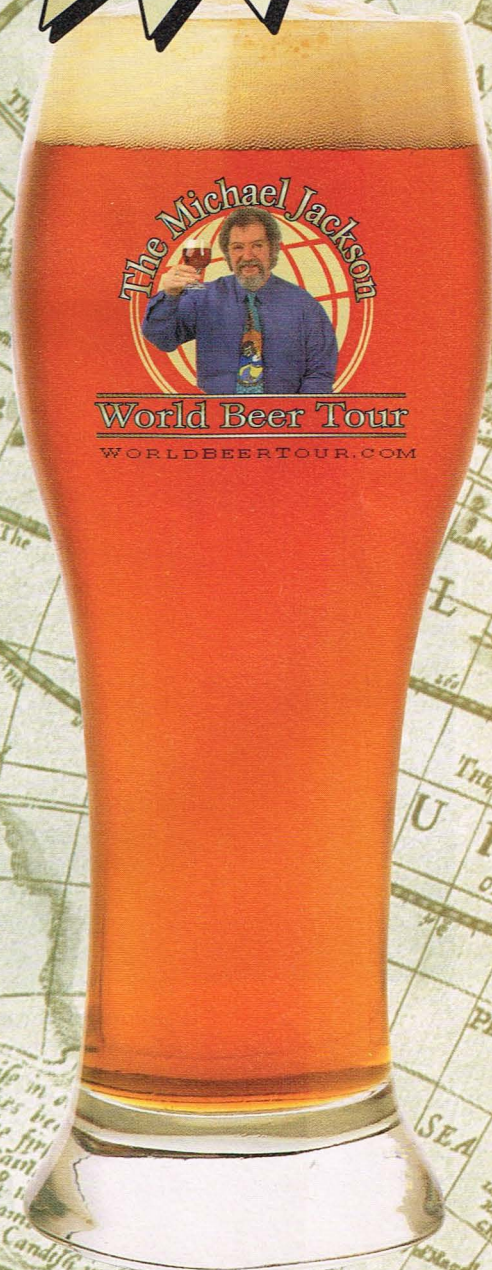


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# Big Brewing for Risky Times Prepare Now for Y2K

There's this guy who has stockpiled more than 500 pounds of dried beans in preparation for the new millennium and its heralded chaos. Crazy! Anybody in their right mind knows stocking up on beans is a foolish waste of time — not to mention energy. What we'll need is beer, and lots of it!

When civilization is crashing around us, homebrewers will be called upon to double their efforts. "Dinky" stove-top batches will not suffice for the days and months and possibly years of darkness ahead. Especially not with family and friends looking to quench their thirsts, too.

Who will the multitudes turn to in the midst of chaos and anarchy? The police? Yeah, right. Scientists? They're the one's who have gotten us into this mess in the first place! Farmers? Well, yes, farmers will be a handy group to have around. But it is a valid belief that homebrewers will become prized commodities for every community. People will be willing to trade their best chickens, their plumpest bushels, their last gallons of kerosene — all for a six-pack or two! The brewer will be

sitting pretty! Especially the brewer who learns now that big-batch brewing is the only way to brew.

But what if this prognostication is wrong? What if on January 1 you wake up and the only glitch detectable is an ATM that thinks you haven't been born yet? Well, big-batch brewing has lots of advantages besides the survival of Y2K.

The most detectable benefit is the sheer volume of beer. Imagine brewing twice as much with only minimal extra time involved. When that keg of really tasty ESB starts kicking out foam and yeast, it is a joy to think you've got another batch just like it waiting to be tapped. And when friends come over, beer is plentiful. The fact of the matter is, your beer is the most expensive beer on the market, if you consider how much your free time is worth. Doubling or tripling your gallon capacity ensures that the quantity of beer will rise while the hourly investment will drop significantly.

Brewing large batches of beer means, most likely, using a propane burner, which can give you a better boil, which will produce a higher-quality wort. Propane burners are

by Keith T. Yager





Computers might fail, banks might close, planes might not fly. But you can be well prepared for the chaos threatened by Y2K. Just step up your brewing now. A full cellar will put you in the driver's seat during the unstable times ahead!



also more time efficient, bringing to boil a relative amount of wort in much less time. Brewing on a propane burner means you will get out of the kitchen — and in better graces with your spouse. No more malt-ruined stove tops. Cleanup is a breeze because you can use a garden hose instead of a mop and bucket.

Of course, it isn't all peaches and krieg. All-grain brewers have a much larger volume of grain to grind, which can be a hassle — especially if you grind it the same day you brew. Bottling can be a real chore unless you have friends who are just as ready to help fill a bottle as they are to drain it. Even kegging is twice as much work. And moving incredibly heavy volumes of boiling wort can be a back-breaking, dangerous chore if arrangements are not made. Braving the outdoor elements also can be a hassle, even though Y2K will most likely wipe out all electricity and you'll be freezing your butt off anyway. Thankfully, most of these hassles can be moderately to greatly alleviated, if not eliminated, so cheer up.

## Equipment

The following equipment is essential to big-batch brewing:

- Propane or gas burner
- Large (12- to 17-gallon) boiling vessel with exit spigot (A large, industrial keg works great and is inexpensive.)
- Large mash/lauter tun (Again, a 17-gallon keg makes a wonderful mash/lauter tun and can be converted for less than \$65 with a weldless conversion kit, discussed below. You can use one keg as both your mash/lauter tun and boiling vessel.)
- Sturdy, raised surface for gravity transfer of boiling wort (A sturdy picnic table works well.)
- An outdoor cooling system designed to cool 10 gallons of wort in a reasonable time (Your old copper tubing will work, plus a plastic 10- to 15-gallon tub used for an immersion bath.)
- Almost all of your old five-gallon brewing hardware

## Propane Burners

One of the most important aspects to consider when choosing a propane burner is safety. You want to be sure that your brewpot or converted keg is situated securely upon the burner so that a slight bump or rock won't send a cauldron of dangerously hot wort spilling on yourself or your fellow brewer. To fit a standard-size industrial keg, the burner base should be approximately 13.5 inches in diameter. (The "lip" or base of the keg will overlap the base of the burner at this size.)

Look for one burner that can handle all of your brewing needs. Adjustability is an important attribute. A burner should be able to regulate a low flame without going out. This gives you the option to gently heat a 30-pound mash without scorching the bottom. A wind guard (which is really just a fancy name for a metal ring that shields the burner) will help ensure that a low flame stays lit even on a windy day.

A brewer's best bet is to stay away from the jet-type burners. These burners use a single, concentrated flame and scorch the wort easily. Most standard "turkey fryers," which can be found in many hardware stores, work nicely and cost around \$75 to \$80 (and often come with a seven-gallon pot, too). Smaller burners can be found for \$35 to \$40 and work nicely as secondary burners for heating sparge water.

It is also a good idea to keep a spare, full propane tank handy, in case a tank kicks out before a batch is finished boiling. Few things are more disheartening than running out of gas halfway through a boil. Propane is an efficient and cost-effective energy source. A 25-pound tank generally lasts four brew sessions, if the temperature control is kept below medium. A high flame is a waste of money and energy because it will drain a tank in what seems like no time and can scorch the wort.

## Converting a Keg

Converting a keg that you have purchased from a brewery is really easy and relatively inexpensive.

Have a welder cut off the top of your keg for you. This will cost about \$10 to \$15. When the keg is cut, you might want to file down any rough edges left by the cut. Also, scour the inside thoroughly with soap and steel wool to remove the arc welding residue and any old beer stains or odors.

A weldless conversion kit is easy to install and should cost around \$65. The kit contains a 10-inch perforated steel screen and an exit faucet. The 10-inch steel screen might seem confusing at first because the bottom of the keg is around 15 inches in diameter, but it makes sense when you realize that the bottom of your keg is concave.

The screen fits neatly in the bowl of the concave part, leaving an inch or two of false bottom space below. An arm bends into the large hole in the center of the screen and out the exit spigot. It works like a charm. In the old double bucket lauter tun method a brewer had to fill the bottom of the bucket with up to 1.5 gallons of 170° F water just to float the mash. With the keg conversion method, only a couple of inches of water are needed to float the mash.

One drawback and unexpected expense in the weldless keg conversion is the one-half-inch drill bit, which costs \$25. You might want to ask around and find a friend with this size bit or ask the welder to drill the hole for you.

Many brewers might be afraid that a weldless system would leak under the strain and stress of exposure to extremely high temperatures. As long as the brewer is careful to check for leaks before brewing, this simply is not a problem.

After the keg is converted, fill it with water at different gallon levels (five, 10, 11, 12) and mark each level on the outside of the keg. Bring the water to a boil to check for leaks. If there is a leak, you might have your exit faucet turned too tight. Loosen it one-eighth of a turn and try again.

## Preparing for the Big Day

Even without the Y2K fiasco, ordering grain and hops in bulk



makes sense for large-batch brewing. Grain should stay good for about a year when stored uncrushed and sealed. And it's always smart to have enough on hand to start a brewing session whenever you are ready. Plus, buying grain in bulk will save you money.

Depending on the quality of the grain grinder you own, you might want to start grinding your grain a couple of days early and seal it in air-tight bags. Grinding 30 pounds of grain all at once with a Corona-type mill can be a challenging situation to confront. But split up among two or three days, the problem is easy to tackle. The other solution is to buy a large-capacity grain mill. Some home mills claim to grind at speeds of up to 2.5 pounds per minute. Of course, these mills also cost upward of \$180.

Brewing liquor is also something that is wise to prepare in advance. If you boil tap water to remove chlorine or temporary hardness, you might want to start this a couple of days ahead of time. You can't have too much water when brewing, but having too little can be a real problem. A couple of days before you begin brewing, prepare 10 gallons of water by boiling it for a half hour to remove chlorine. If necessary, boil with your brewing salts. After the water has cooled, you can transfer it to your clean carboys or sealed plastic buckets. The day before you brew, boil 10 more gallons of water and let it cool overnight. Leave this water in the pots covered loosely with a lid or aluminum foil for use the following day.

If you have a spare refrigerator with a freezer, start saving your milk jugs and two-liter soda bottles. Clean the jugs thoroughly, fill them with water, and store them in the freezer. You can use these huge blocks of ice in combination with your immersion chiller to cool your wort, especially in the summer. Of course this method only works if you still have electricity.

## Preparing Yeast

Growing enough viable yeast cells to ferment 10 gallons of beer is not really any more laborious than culturing yeast for a five-gallon batch. Simply split the yeast starter into two separate 22-ounce bottles. Continue pitching and decanting until you are comfortable with the amount of yeast you have cultured. Just before you start brewing, decant the finished beer and pitch a couple of inches of fresh wort on the yeast sediment.

While you are collecting your cooled wort in your carboys, catch about three-fourths gallon of wort in a sanitized gallon jug. This small amount of wort can be cooled to pitching temperature in less than half an hour. Pitch the remaining two bottles of yeast sediment (now in high kraeusen) and set aside. In less than six hours this jug of wort will be in high kraeusen and your two carboys will be at pitching temperature. Divide the gallon jug as evenly as possible between the two

carboys. This method works especially well for lagers because of the lag time necessary to cool the wort below 60° F. This also frees up some head space for adequate aeration.

## Tackling Brew Day

If all preparations are made in advance, brew day should only consume about six to seven hours, not much longer than a five-gallon all-grain brew day. Having all preparations made beforehand (equipment sanitized, grain ground, and everything else) really helps brew day go smoothly. Because of its ease in brewing, ale is a good candidate for a first big-batch brew.

## Armageddon ESB (10 gallons, all-grain)

### Ingredients:

- 16 lbs. English two-row malt
- 1 lb. toasted malt (350° F for 15 min.)
- 3 lbs. carapils
- 1.5 lbs. crystal malt, 40° Lovibond



TODD HAMMOND

Using a converted keg is a great way to step up your brewing volume. Many homebrew shops sell converted kegs, or you can buy a used keg and convert it yourself.



- 1 oz. Columbus hop pellets (10% alpha acid, 10 AAUs) for 60 min.
- 7 oz. Kent Golding whole hops (4% alpha acid, 28 AAUs): 4 oz. (16 AAUs) for 60 min., 2 oz. (8 AAUs) for 15 min., 1 oz. (4 AAUs) for 5 min.
- American or London-style ale yeast
- 1 1/2 cups corn sugar or 2 1/2 cups dry malt extract for priming (3/4

cup corn sugar or 1 1/4 cup dry malt extract per 5 gal.)

#### Step by Step:

Place crushed grains in your mash tun. Add 4 to 4.5 gal. of 168° F water to your grains. Stabilize the mash around 155° F. Cover with aluminum foil and wrap with as many sleeping bags, towels, and old blankets as possible. Let the

mash rest for 60 minutes. Check the temperature at 30 minutes, and add low bottom heat if necessary.

Bring 12 gallons of sparge water to around 168° to 170° F. You might want to heat the sparge water in your old brewpots on the stove or, if you have a large boiling vessel, on your propane burner.

Hint: If you have two five-gallon pots from your old brew system, you have enough capacity to heat 12 gallons of sparge water. Fill both pots to five gallons each and reserve the remaining two gallons. Keep one pot on low heat on the kitchen stove, the other pot on low heat on an outside burner. When the sparge water temperature drops too low, add more heat. When it rises too high, add some of the reserved water. This is an easy way to regulate sparge water temperature.

Check for saccharification with an iodine test and begin sparging. Recirculate the wort until there is no particulate. If your lauter tun is the same vessel as your boiling kettle, then collect the first five to six gallons of wort in a plastic bucket or old five-gallon brewpot. Once you've collected five gallons, begin heating this first-run on a low heat, bringing it close to a boil. Collect the remaining wort. Total collection should be 11 to 12 gallons. Turn the spent grain onto your compost pile and hose out the lauter tun. Remove the screen and the arm, and you suddenly have a boiling vessel with a 15-gallon capacity.

The single most enormous problem to big-batch brewing is moving the incredibly heavy, scalding hot wort. If you are accustomed to starting a gravity feed to cool your wort, you are in for a big problem when the time comes to move the boiling vessel. Your best bet is to boil the wort on a high surface to start with. Carefully place the propane cooker and tank on a high, sturdy surface, such as a wooden picnic table. It is very, very important that this be a sturdy surface. If you have any doubts at all about the structure, don't use it.

Ignite the burner, then turn the

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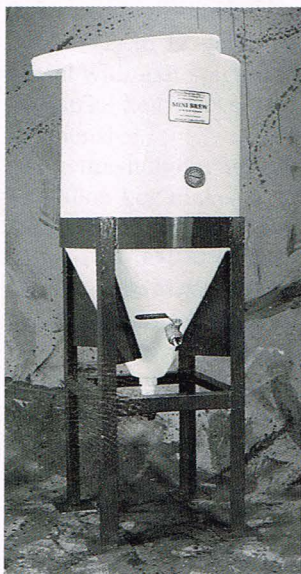
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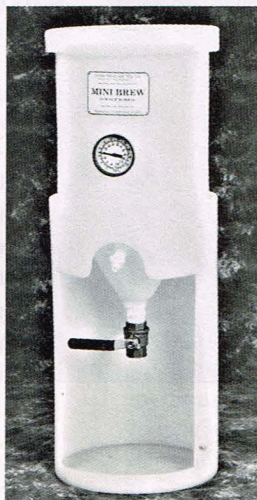
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flame to low. Place the boiling vessel upon the burner. With a gallon pitcher, gently pour the wort into the boiling vessel. Turn the flame to medium and take a break. Hint: Depending on the burner you choose, the heat should be regulated on a medium to medium-high temperature. Just be sure that the flame is not hot enough to burn the bottom of the beer. At medium, a good burner should bring 11 gallons of wort to a full boil in less than an hour.

The total boil will be 60 minutes. Add Columbus hop pellets and four ounces of Kent Golding whole hops once the boil starts. Use muslin hop socks for whole hops. This will allow you to remove all hops before chilling. Alternatively, if you put your lauter screen back into the kettle before the boil, it will work as a great hop strainer. Boil 15 minutes and then loosely cover the pot with aluminum foil, leaving adequate steam ventilation but deterring foreign matter from landing in the boil. Boil for 30 minutes more and add two ounces of Kent Golding hops. Boil 10 minutes more and add one ounce of Kent Goldings. Boil five minutes more. Turn off heat.

By the time the boil is finished you should have two clean, sanitized carboys waiting quietly to be filled. Each one should either be plugged with a rubber bung or covered with a clean paper towel lightly dampened with rubbing alcohol.

To cool the wort, set your copper coils in an immersion bath. A 15-gallon plastic tub works well for this. If you're using a picnic table as your high surface, place the tub on one of the seats and fill with water from the garden hose.

Hint: The wort passing through the chiller will warm the water and lessen the effectiveness of the cooler. One way to drain your tub is to cut a large hole (two to three inches in diameter) near the bottom of the tub. Stuff with plastic grocery bags. When the water is too warm, clamp the exit hose and pull the plug. Then simply refill with the

hose. You might need to do this two or three times, depending on how cold your water is.

If you choose, you can use the ice you've stored in the spare freezer to help cool your wort. Carefully cut the jugs apart with a utility knife and place them in your immersion chiller as necessary. This is an efficient and cheap way to turn summer hose water into ice water.

Pitch yeast at 68° to 70° F. Ferment 10 to 14 days at 65° to 68° F. Prime and bottle.

That's it! You've successfully doubled your brewing capacity. As you carry both of your carboys into your fermentation cellar, a feeling of hope will come over you. Maybe, just maybe, we can survive this Y2K thing. With enough beer, anything is possible! 



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# 15 Tips for 2000

One of the great things about the craft and hobby of brewing is that there is generally no single right way to go about it. While the overall principles are rooted in science, the way we as brewers guide the brewing process is a matter of how we apply the equipment and materials at hand to the procedure.

As brewing has progressed, many of the technological advances that have made their presence known in the commercial brewing arena have filtered down into the homebrew hobby. Much like their commercial counterparts, most homebrewing setups tend to have their own little customized quirks that are particular to the brewer, setup, location, or equipment used.

Fortunately, in a world that is facing the technological uncertainties and insecurities of the

anticipated Y2K computer bug, some of the most innovative tricks that we can apply to our homebrewing setups are remarkably effective and reliable low-tech solutions to everyday homebrewing challenges.

## 1. Kick the bucket.

Most homebrewers begin the hobby by using food-grade plastic buckets or pails as fermenters. While these can give great results, many homebrewers later switch to glass carboys. There are many advantages to using carboys, but ease of handling is not one of them. A five-gallon glass carboy full of wort can weigh more than 40 pounds. While there are many devices on the market designed to make carboy handling easier and safer, for many homebrewers a retired plastic fermenter can be one

by John Oliver





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option that is overlooked.

Most plastic buckets have a bail or handle, and the diameter on many is sized perfectly to hold a five-gallon glass carboy nestled securely inside the bucket. The bucket handle provides ease in moving, while the plastic sides not only help protect the fragile glass from any errant strikes or impacts, but also help provide a degree of insulation that can aid in temperature control.

It is critical to remember that while this method is very convenient, you should never rely solely on the handles of any plastic pail or any carboy-holding device to provide absolute grip. Always use care and attempt to support the weight of the load from beneath the carboy, not by the neck or by the handles only.

## 2. Fermentation's a drag.

Another great trick for moving full carboys or fermenters from one

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household location to another is as simple as using an old rug or blanket. Placing the fermenter on an old blanket provides for absorption of overflow or unexpected spills. In addition by grabbing the free end of the blanket and pulling it like a sled, it is easy for one person to slide or drag a fermenter from one room to another without actually lifting it.

Best results for this method are obtained on cement or hardwood floors, but the same ease can be had on certain types of rugs and carpeting as well. As always, any time you are moving a heavy glass fermenter, exercise care.

### 3. Make a keg ice chest.

Many large glass carboys (6.5 or seven gallons) that were originally designed to hold acid have Styrofoam carriers that are specifically designed to insulate and protect the carboy during shipping. Cut a small circle out of the top of the carrier. Not only does it still work as a carboy insulator, but it makes an excellent insulating ice chest for Cornelius-style kegs. This also allows easy access to the quick-disconnect fitting on the top of the keg. This is an ideal setup for those summer and fall picnics and barbecues.

### 4. Slip into soapy precoats.

When using a propane-powered outdoor cooker, it is not unusual to end up with a substantial layer of stubborn soot stuck to the sides and bottom of the mash vessel or kettle. While this is not a permanent condition, cleanup and removal of all of the soot can pose a messy challenge, resulting in sooty handprints throughout the work area and house.

All of this easily can be avoided by lightly coating the bottom and sides of the pot (outside only!) with a liquid dish soap prior to the brewing session. While the soot, which is usually a result of incomplete or inadequate combustion, will still form on the kettle, it will be a breeze to remove afterward with a little bit of hot water and a

scrub pad. And the pot will not be permanently stained or require any difficult scrubbing or abrasives.

### 5. Use this slick capper trick.

The crimping cup on most quality bottle cappers, regardless of style of capper, is made of stamped steel. Because caps are made out of a similarly hard metal, capper cups often show signs of wear after a

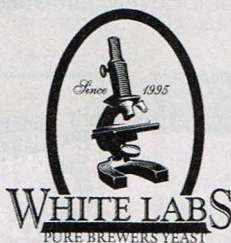
short time. This results in sloppy crimps.

To extend the life of your capper, prior to the next bottling session apply a light coating of cooking oil, grease, or petroleum jelly (such as Vaseline) to the inside of the crimp cup. This will ease the effort needed to crimp the caps onto the bottles and will go a long way toward extending the life of the

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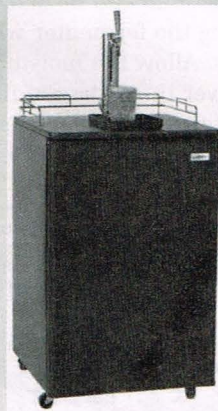


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capper. A light coating of lubricant also will allow the capped bottles to release easily from the capper.

Keep in mind that a little goes a long way; the goal is to have a light coating of lubricant on the outside of the caps, not running down the sides of the bottles.

Excess use can result in contamination that will affect the beer inside the bottles, possibly resulting in beers with off-flavors or poor foaming and head-retention capabilities.

## 6. Dunk the frozen doughnut.

Keeping fermentation temperatures cool in the middle of summer without a refrigerator dedicated solely to brewing can be a challenge. Inexpensive temperature control often can be achieved by draping the fermenter with wet towels. Allow the moisture to evaporate over the course of the day to provide some level of cooling.

This can further be enhanced by

a trip to the nearest Tupperware outlet. Purchase a plastic mold used for forming Jell-O. Fill the plastic

**Purchase a plastic mold used for forming Jell-O. Fill the plastic mold with water and place it in the freezer.**

mold with water and place it in the freezer. The result is a frigid doughnut that can be set on top of a plastic fermenter or placed over the neck of a carboy, allowing

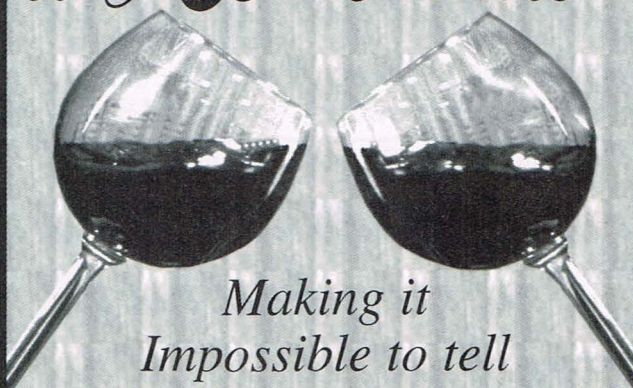
ice-cold water to run down the sides of the fermenter as the ice melts. Just refill the plastic mold each time you remove an ice ring. This provides a continual supply of frozen rings for the duration of most normal fermentations, even during the hottest weather.

## 7. Rack 'em.

Siphoning beer from one vessel to another can be a challenge, but a number of simple tricks can ensure that your next beer transfer goes smoothly. It is not unusual for bubbles to form at the highest point in a siphon. They can accumulate until eventually the flow is broken and it is necessary to prime the siphon and start over.

This is because CO<sub>2</sub> that is dissolved in solution in the fermenter comes out of solution due to the drop in pressure inside of the siphon. Flow easily can be maintained, however, by quickly pinching and releasing the siphon tubing

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directly upstream of the bubbles, causing the flow to stop for an instant. When the flow resumes, the annoying bubbles should travel down the siphon tube into the receiving vessel. The trick is to do this before the annoying bubbles accumulate to the point where they stop the flow of the siphon.

## 8. Mix your prime.

To bottle condition and carbonate beer, it is standard procedure to dissolve a measured amount of priming sugar or malt into solution, and then mix the solution with the finished beer prior to bottling. You can make sure the priming solution is completely and evenly mixed in by adding it to the bottling bucket prior to racking or transferring the beer.

The transfer will usually result in enough turbulence to mix the priming solution evenly throughout the batch, resulting in consistent carbonation levels in every bottle.

Just remember that excessive foaming or splashing can result in unwanted oxygen becoming dissolved in the wort. This causes stale flavors or off-flavors in the finished beer.

## 9. Purge oxygen.

Brewers with carbon dioxide bottles and tap systems can take further steps to help prevent oxidation or staling of beer. Prior to transferring any beer into a sanitized secondary fermenter or keg, place the output hose from the CO<sub>2</sub> bottle into the vessel. Allow the CO<sub>2</sub> to run for a minute.

Because CO<sub>2</sub> is heavier than air, it will settle into a blanket, in the bottom of the fermenter or keg. When the beer is transferred into the vessel, any remaining oxygen will be purged through the top of the vessel as the liquid level rises. This leaves a blanket of CO<sub>2</sub> gas in contact with the beer.

Oxidation is not limited to finished beer. Brewers who take advantage of purchasing in bulk can prevent the quality of their ingredients from staling by gently purging sacks of unused malt or hops with

CO<sub>2</sub> prior to putting them back into some form of air-tight storage for future use.

## 10. Test with pediatric titrations.

Titration is a process whereby a known amount of a compound is introduced into another known volume. The results are used to calculate measurements for a larger volume. Put in practical terms,

when using spices, flavoring additives, or essences it can be difficult to know exactly how much to introduce into a batch of beer to get a known result.

A lot of guesswork and the resulting bad batches of beer can be eliminated by performing some simple tests using a small tasting glass, a sample of similar homebrew or commercial beer, the flavoring

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compound, and a children's medicine dropper or syringe, which is available over the counter at most pharmacies. Such droppers are usually calibrated pretty accurately and allow for precise metering of a solution one drop at a time.

By introducing a flavoring compound into a known quantity of beer and recording the amounts until the desired result is reached, you can accurately calculate how much flavoring substance to add to the entire batch of beer. This eliminates the guesswork and the risk of ruining a full batch by adding too much flavoring.

In addition such a device makes it possible to dose directly into the bottle at bottling time. That way you can achieve several different results to be bottled from one single batch of homebrew.

## 11. Defy gravity.

Sooner or later it happens to almost every all-grain brewer: the

dreaded stuck run-off. Brewers using a tiered type of brewing system in which the hot liquor tank is located above the mash tun during sparging have a quick and easy fix at their disposal. Simply route the sparge water hose directly into the output of the mash tun and open the valves. Gravity will cause hot sparge water to flow into the mash tun under the false bottom, resulting in a loosening or underletting of the mash bed.

After a brief recirculation to reset the filter bed and clear the run-off, it is usually possible to continue sparging at an improved rate with little or no loss of heat or run-off.

## 12. Use your marbles.

When dry hopping with whole hops, the hops usually will clump and float on top of the fermenter, resulting in reduced contact with the wort and a loss of efficiency. Place the raw hops loosely in a

nylon or cheesecloth hop bag, then add several glass marbles. The bag and its hoppy contents will sink to the bottom of the fermenter. This allows maximum wort contact and extraction.

The glass marbles also can be sanitized easily prior to being added to the fermenter. Simply sanitized them in the same way that you treat any other type of brewing equipment, and the glass will not react with the beer to create off-flavors.

## 13. Let it settle.

While most brewing literature stresses that one of the most critical times for sanitation and possible contamination is immediately after the boil and prior to introducing yeast, this is one point when a brewer can improve the quality of his beer by doing nothing for 10 minutes.

Cover the brewpot as soon as you turn off the burner. Sanitary temperatures will be maintained



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while many of the proteins and hop particles stirred up during the boil will settle to the bottom of the pot. Doing this leaves the wort crystal clear.

These compounds can result in inhibited fermentations, poor yeast performance, hazy beer, and unusual off-flavors, so it makes sense to allow them to settle and separate out. The still-sanitary clear wort can be chilled and transferred to the fermenter for the introduction of yeast and a subsequent healthy fermentation.

#### 14. Create a filter screen.

For brewers who siphon the wort from the brew kettle into the fermenter or who have brewpots with a spigot on the side, recipes that contain large amounts of hops, fruits, or other solids can be a nightmare to transfer. These large particles can block the end of the drain, pick-up tube, or siphon, which results in no flow.

A quick fix to this situation can be found as close as the household cleaning aisle in the local supermarket. Some brands of scrubbers used for cleaning pots and pans are made of spun or woven copper wire or strips. Place one of these scrubbers loosely on the end of the pick-up tube. This prevents large particles from flowing into or blocking the ends of the siphon.

It is important to use a scrubber made of copper, because plastic and other materials can react with the wort to create off-flavors. In addition make sure the brand you have selected is a scrubber only and is not filled with cleansers or detergents!

Simply allowing this device to touch the boiling hot wort for a few minutes should be adequate to ensure sanitization and a subsequent smooth transfer. Just make sure not to use the copper scrubber in beer, because it oxidizes beer. You also can use stainless steel scrub pads as racking filters for wort and beer if, for example, you have fruit in the fermenter.

#### 15. Enjoy a splice of life.

For do-it-yourselfers who make their own wort chillers out of copper tubing, there will probably be a few short pieces of copper scrap left over. This scrap can serve as a useful tool to help splice together sections of  $\frac{3}{8}$ -inch siphon hose. Just cut any leftover copper tubing into sections of about 1 inch. The pieces are also the perfect diameter

to place in the hole of most drilled stoppers to allow hooking up of a blow-off tube during fermentation.

By incorporating some of these tricks into your brewing regimen, you can enjoy smooth, trouble-free brewing well into the next century.

*John Oliver is a BJCP National-level judge and head brewer for BJ's Brewery in Brea, Calif.*

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# A Delicious Way to Celebrate

Beer is the beverage of celebration. The coming of the millennium is the biggest universal celebration we will have in our lifetime. What better way to welcome it than with the world's oldest and most loved beverage, beer? For centuries special beers have been brewed for events and celebrations. From Oktoberfests in Germany to baseball games in America, beer is the beverage of choice.

There are many ways to welcome the 21<sup>st</sup> century, from attending a gala with thousands of people to standing on a mountain top and viewing the first sunrise of the millennium. Many people are staying home on New Year's Eve, rejoicing with family and friends. It is cozy, intimate, and away from the maddening crowds. This beer dinner is created for them.

Forget Champagne with its inflated prices. Ring out the old and bring in the new with a sparkling framboise. The minute you pop open the bottle the room is engulfed in the heady aroma of raspberries. Effervescent as Champagne, framboise will set your mouth aglow as well as all your senses.

After all the excitement has died down, sit next to a roaring fire with a barleywine or Belgian tripel, letting the warmth of the brew and the fire slowly relax you. As you gaze into the fire, contemplate the past century and look

forward to the new one. With family and friends near — and plenty of good beer — this is truly a celebration.

If you have not yet brewed a beer for your millennium party, we have a quick and easy recipe for a winter warmer. It's a wonderful beer for this time of year. It will pair nicely with almost any type of food and is equally delicious alone. This festive brew has a complex, balanced aroma and flavor of malt and hops. From the blend of (buttery) diacetyl and earthy hops in the aroma to the swath of silky malt in the finish, this brew will welcome you into the next century.

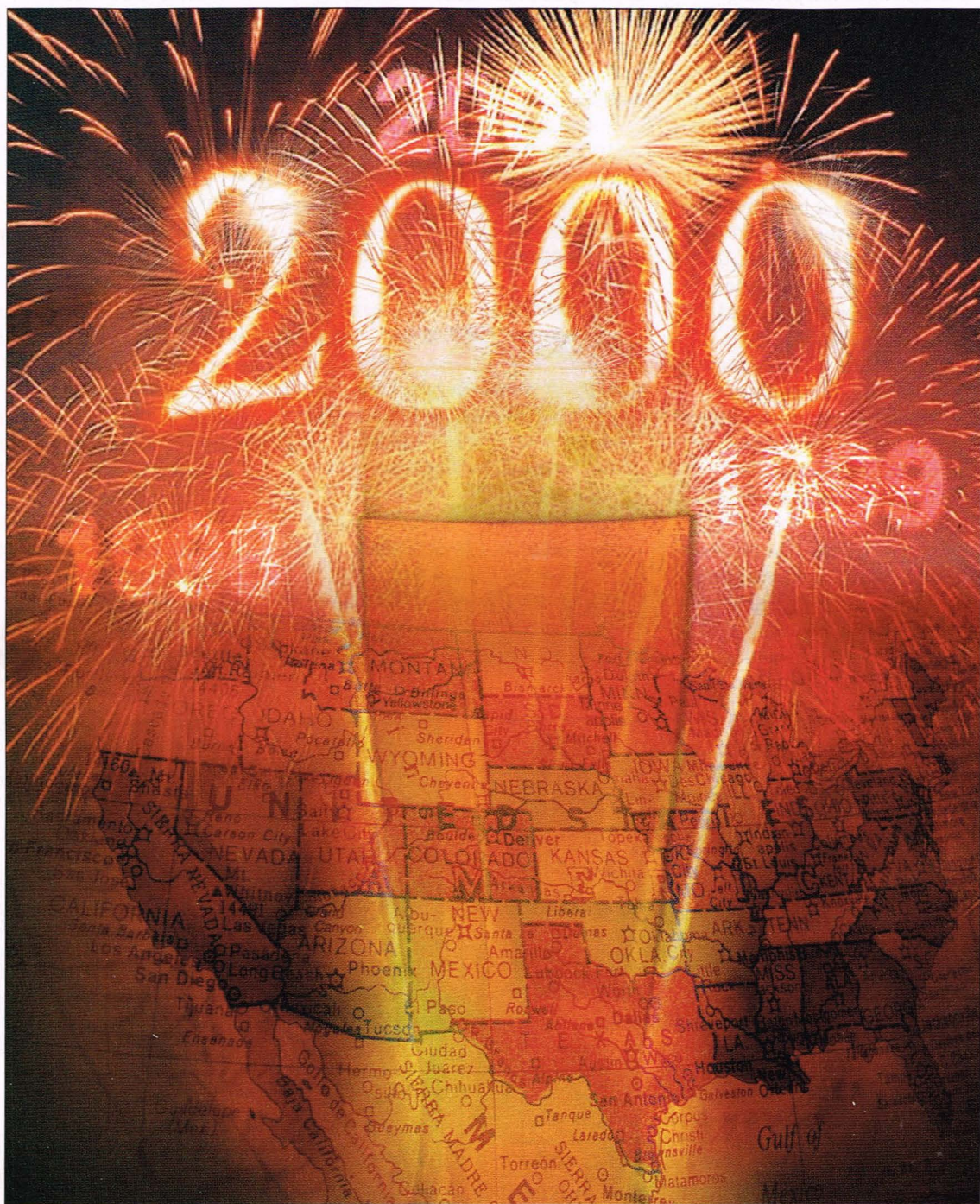
## Welcome 2000 Winter Warmer (5 gallons, extract with grains)

### Ingredients:

- 14 oz. British crystal malt, 55° Lovibond
- 8 oz. British two-row pale malt (toasted in oven for 30 min. at 250° F)
- 4 oz. torrified wheat
- 7.75 lbs. Muntons light dry malt extract
- 1 oz. Northdown hops (7% alpha acid, 7 AAUs) for 60 min.
- 1.5 oz. Kent Golding hops (5% alpha acid, 7.5 AAUs): 0.5 oz. (2.5 AAUs) for 15 min., 1 oz (5 AAUs). for 1 min.
- 0.5 oz. Fuggle hops (5% alpha acid, 2.5 AAUs) for 15 min.
- 1 tsp. Irish moss

by Tess Szamatulski







- Wyeast 1084XL (Irish ale)
- 3/4 cup corn sugar for priming

### Step by Step:

Crush and steep the grains in 1 gal. of 150° F water for 25 min. Strain the wort into your brewpot. Sparge the grains with 0.5 gal. of 168° F water.

Bring the wort to a boil, remove the pot from the stove, and add malt extract and Northdown hops. Total boil is 60 min. Add additional water to the brew pot for 2.5 gal. total volume. Boil 45 min. Add Fuggles, 0.5 oz. Kent Golding hops, and Irish moss. Boil for 14 min. more, then add 1 oz. Kent Goldings. Boil for 1 min. more, then remove the pot from the stove and cool for 15 min. Strain the cooled wort into the primary fermenter and top up with cold water to 5 gal. When temperature is colder than 80° F, pitch yeast.

Ferment at 68° to 70° F in the primary fermenter five to seven

days or until fermentation slows, then siphon into the secondary fermenter. Ferment in the secondary at 68° to 70° F. Prime and bottle when fermentation is complete.

OG = 1.076 to 1.080

FG = 1.015 to 1.017

Bitterness = 29 IBUs

Color = 17° SRM

6.5% ABV

### Mini-Mash Recipe (5 gallons)

#### Ingredients:

- 14 oz. British crystal malt, 55° Lovibond
- 2.5 lbs. British two-row pale malt (toasted in oven for 30 min. at 250° F)
- 4 oz. torrefied wheat malt
- 5.5 lbs. Muntons light dry malt extract
- 1 oz. Northdown hops (7% alpha acid, 7 AAUs) for 60 min.
- 1.5 oz. Kent Golding hops (5% alpha acid, 7.5 AAUs):  
0.5 oz. (2.5 AAUs) for 15 min.,  
1 oz. (5 AAUs) for 1 min.
- 0.5 oz. Fuggle hops (5% alpha acid, 2.5 AAUs) for 15 min.
- 1 tsp. Irish moss
- Wyeast 1084XL (Irish ale)
- 3/4 cup corn sugar for priming

### Last-Minute Brewing

To be sure that this beer will be ready in time for your celebration here are a few hints to speed up fermentation:

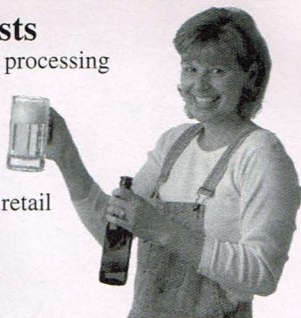
- Use Wyeast 1084XL (Irish ale) yeast, which is 175 mL size, or make a large starter.

- Oxygenate your wort when pitching the yeast, so fermentation will begin faster.

- Instead of bottling, keg this beer so it will definitely be ready by New Year's Eve.

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### Step by Step:

Heat 3 qt. water to 167° F. Add the crushed grains. Stabilize at 150° F to 152° F. Maintain this temperature for 60 min. Sparge with 1 gal. of 168° F water. Follow the extract recipe for boiling and fermentation times.

### Full-Mash Recipe (5 gallons)

#### Ingredients:

- 14 oz. British crystal malt, 55° Lovibond
- 11.5 lbs. British two-row pale malt (toasted in oven for 30 min. at 250° F)
- 4 oz. torried wheat malt
- 0.5 oz. Northdown hops (10% alpha acid, 5 AAUs) for 60 min.
- 1.5 oz. Kent Golding hops (5% alpha acid, 7.5 AAUs):  
0.5 oz. (2.5 AAUs) for 15 min.,  
1 oz. (5 AAUs) for 1 min.
- 0.5 oz. Fuggle hops (5% alpha acid, 2.5 AAUs) for 15 min.

- 1 tsp. Irish moss
- Wyeast 1084XL (Irish ale)
- 3/4 cup corn sugar for priming

### Step by Step:

Heat 4 gal. of water to 167° F. Add the crushed grains. Stabilize at 150° to 152° F. Maintain this temperature for 60 min. Recirculate the first gal. of hot wort into the lauter tun. Sparge for 30 min. with enough 168° F water to make 5.75 gal.

Total boil is 90 min. Boil the wort for 30 min., then add Northdown hops. Boil for 45 min. more, add Fuggles and 0.5 oz. Kent Goldings. Boil for 14 min., add 1 oz. Kent Goldings. Boil for 1 min. more, then remove the brew kettle from the heat.

Follow the extract recipe for boiling and fermentation times.

### Millennium Party Menu

Prepare these dishes for your party. Each recipe serves six.

### Beer and Cheese Fondue

Fondue sets the stage for intimate gatherings. The silky cheeses combined with the surprise of caramelized onion and hint of Tabasco swirled on cubes of bread make this a fun and delicious appetizer.

#### Ingredients:

- 1 small onion, finely diced
- 3 Tbsp. unsalted butter
- 1 large clove garlic, halved
- 3 cups shredded sharp white cheddar cheese
- 1 cup crumbled Boursin cheese (Gruyère can be substituted)
- 1 cup flavorful ale such as a winter warmer (Samuel Smith's Winter Welcome) or a nut brown ale (Samuel Smith's)
- 1 tsp. Tabasco (or hot sauce)
- 1 Tbsp. lemon juice
- Salt and pepper to taste
- Sprinkling of nutmeg (optional)
- 1 large loaf of Italian bread, cubed (each piece of bread should have

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a bit of crust on it), or a combination of Italian and dark pumpernickel bread

### Step by Step:

Rub a fondue pan with garlic and then discard the garlic. In a saucepan melt the butter and sauté the onion until the onion is caramelized. Add ale, Tabasco sauce, and lemon juice. Heat until barely simmering. Whisk in cheese 1/2 cup at a time until all is incorporated and fondue is smooth. Season with salt and pepper. Pour into fondue pot and sprinkle with nutmeg, if desired. Serve with cubed bread.

Serve with a nice, hoppy IPA such as Harpoon IPA or Abbey-style Belgian tripel such as Westmalle.

### Shrimp Poached in Pale Ale

Serve these tender shrimp plumped in pale ale, icy cold. Paired with spicy cocktail sauce and plenty of citrus wedges this appetizer will usher in the millennium with style!

### Ingredients:

- 1.5 lbs. jumbo raw shrimp (12 to 14 per pound)
- 24 oz. of pale ale (Anchor Liberty Ale, Young's Special London Ale, Bass Ale)

### Step by Step:

Devein shrimp, leaving the shell on. Put in a pot and cover with cold beer. Cover and cook on high heat. When the beer is briskly boiling, take the pot off the heat and let it sit, covered, for 3 min. Drain and cool. Remove the shells, leaving the tail on, and refrigerate.

### Spicy Cocktail Sauce

### Ingredients:

- 1/2 cup good-quality ketchup
- 2 Tbsp. fresh horseradish (use 3 Tbsp. if you want more of a zing)
- 1 tsp. Tabasco (or hot sauce)
- 1 Tbsp. chopped fresh cilantro
- Lemon and lime wedges
- Baby mixed lettuce

### Step by Step:

Stir together the ketchup, horseradish, and Tabasco sauce. Refrigerate for at least 60 min. or overnight. Place shrimp on a lettuce-lined plate with lots of lemon wedges and cocktail sauce on the side.

Serve with a robust stout such as Guinness or Murphy's or a porter such as Yuengling or Samuel Smith's Taddy Porter.

### Grilled Wild Mushroom Bruschetta

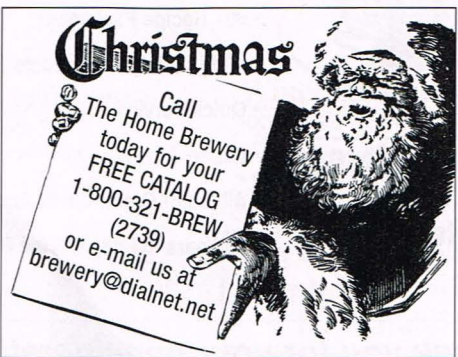
Wild, earthy, and complex, the intensity of the grilled mushrooms complements the smokiness of the mozzarella, with a splash of red ale marrying the flavors.

### Ingredients:

- 1 lb. assorted wild mushrooms, cleaned and de-stemmed (porcine and shiitake)
- 1 loaf French bread cut diagonally in 12 slices



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- 3 cloves garlic, halved
- Olive oil, for brushing on the mushrooms and French bread
- Salt and pepper
- 6 oz. smoked mozzarella, diced
- 6 sundried tomatoes in oil, diced
- 11 fresh basil leaves: 5 torn in small pieces, plus 6 whole leaves for garnish
- 1/4 tsp. dried oregano
- 3 Tbsp. olive oil
- 2 Tbsp. balsamic vinegar
- 3 Tbsp. Belgian-style red ale, lambic, or gueze (Rodenbach Grand Cru, DeTroch Kriek, Hansen's Gueze); a winter warmer or brown ale can be substituted for a milder taste

#### Step by Step:

Brush scrubbed mushrooms with olive oil. Grill until tender, and then cube. Rub the French bread slices with the garlic halves; brush with olive oil and grill.

Mix the mushrooms with salt, pepper, cheese, tomatoes, basil, and oregano. In a saucepan, whisk together the olive oil, vinegar, and beer, and heat until warm. Toss the mushroom mixture with the warmed dressing and spoon it onto the grilled bread. Garnish with a basil leaf and serve.

Serve with an assertive rauchbier (Kaiserdom), smoked porter (Alaskan Brewing Co.), or a hoppy IPA (Grant's IPA).

#### Spinach Salad

Strewn with bacon, baby peas, mushrooms, and red onions and adorned with a creamy beer dressing, this salad will be sure to enliven your palate.

#### Salad Ingredients:

- 6 strips thick-cut bacon, fried crisp and diced
- 12 oz. baby spinach
- 1 cup baby peas, blanched and chilled
- 12 button mushrooms, sliced
- 6 thin slices red onion, separated into rings

#### Dressing Ingredients:

- 2 Tbsp. horseradish
- 1 Tbsp. red wine vinegar

- 1 cup sour cream
- 1/4 cup good-quality mayonnaise
- 3 tsp. grainy mustard
- 1 tsp. chopped fresh thyme
- 1 1/2 Tbsp. chopped parsley (reserve 1/2 Tbsp. for garnish)
- 5 Tbsp. of grand cru (such as Rodenbach) or Belgian white beer (such as Hoegaarden or Blanch de Bruges)
- Salt and pepper to taste

#### Step by Step:

Mix dressing ingredients and refrigerate for at least 3 hours or overnight.

Place spinach on the plate, top with peas, mushrooms, bacon, and red onion. Drizzle on dressing. Sprinkle chopped parsley to garnish. Serve with an alt beer such as New England's Atlantic Amber.



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## Spent-Grain Beer Rolls (makes 12 rolls)

These buttery little morsels are a cinch to make. They can be made in the morning and reheated before dinner.

### Ingredients:

- 0.25 lb. Gambrinus honey malt, crushed (crystal malt can be substituted)
- 1½ cups water
- ½ cup wort
- 1 cup wheat beer (such as Paulaner Hefeweizen)
- ¼ cup Lyle's Golden Syrup or honey
- 1 Tbsp. dry bread yeast
- 6 Tbsp. butter
- 4 to 5 cups flour
- 1½ tsp. salt

### Step by Step:

Steep grain at 150° F for 20 min. in 1½ cups water. Strain grain thoroughly, retaining ½ cup wort. Heat beer, wort, and golden

syrup until warm (70° F). Whisk in yeast and 2 cups of flour to make a sponge. Cover and let proof for 30 min. Sauté one cup of the spent grain in butter until aromatic. (Set aside 1 Tbsp. of grain for topping.) Cool. Add this to the sponge with salt and 2 to 3 cups of flour. Dough should be slightly sticky. Let rise in a warm place for 30 min.

Coat a 12-muffin tin pan with vegetable spray. Preheat oven to 350° F. With a spoon, drop 3 heaping spoonfuls of dough into each muffin cup. Sprinkle a little of the reserved spent grain over each roll. Let rise until they are over the top of the cups (approximately 30 min.). Bake 25 to 30 min., or until they are light brown.

Serve warm with herb butter.

## Chicken and Lobster in Ale

This elegant entree has many flavor components that intertwine during cooking, leading to a dish that is perfectly balanced.

### Ingredients:

- 3 lobsters (1.25 to 1.5 lbs.) or 1.5 lbs. cooked lobster meat (if you purchase lobsters, steam them in Oktoberfest for 10 min.)
- 12 small chicken breast cutlets, trimmed of fat and tendons, slightly pounded
- 3 Tbsp. butter
- 1 Tbsp. vegetable oil
- Salt and pepper
- ¼ cup chopped flat-leaf parsley
- 2 Tbsp. finely chopped rosemary
- 2 whole red peppers, roasted and cut into thin strips
- 4 cloves garlic, thinly sliced
- 3 Tbsp. roasted garlic paste
- 16 oz. of Oktoberfest märzen or Vienna-style lager (such as Ayinger, Spaten, Dos Equis, or Elliot Ness Lager)
- 1 cup chicken broth
- 2 Tbsp. tomato paste
- 8 oz. heavy cream
- 16-oz. can of navy or cannelloni beans, rinsed and drained

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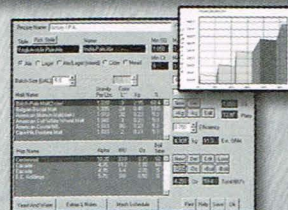
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### Step by Step:

Marinate chicken breasts in 6 oz. of beer for 2 hours. Drain chicken. Salt and pepper the cutlets and coat with  $\frac{3}{4}$  of the parsley and rosemary. Heat the oil and 1 Tbsp. butter in a cast-iron frying pan. Brown the breasts on medium-high heat, 3 min. each side. Put a tight lid on the pan and cook until done, 5 to 7 min. Do not overcook. Remove to a warm serving plate and cover. Add 1 Tbsp. butter to the pan and sauté the garlic until soft (do not brown). Whisk in the roasted garlic paste. Add 10 oz. of beer, 1 cup chicken broth, and tomato paste. Reduce by one-half. Whisk in cream and boil until thickened. Add roasted peppers, navy beans, and lobster meat. Adjust seasonings. Heat thoroughly.

To serve, spoon sauce in the plate, form a bed with the risotto and place two chicken cutlets on top. Spoon a little sauce over the chicken and garnish with a

sprinkling of the reserved parsley and rosemary.

Serve with a Vienna-style lager such as Elliot Ness or an Oktoberfest-märzen such as Ayinger.

### Risotto

Risotto makes the perfect accompaniment to chicken and lobster in ale. It provides the perfect bed for the chicken and lobster to sink into.

### Ingredients:

- 1 lb. arborio rice
- 4 Tbsp. butter
- 1 small onion, diced
- $3\frac{1}{2}$  cups bier de garde or lemon lager or ale (such as Castelain, Jenlain, Pete's Wicked Summer Brew, Samuel Adams Summer Ale)
- $\frac{1}{2}$  tsp. salt
- 1 cup strong chicken broth
- $\frac{1}{2}$  cup Parmesan cheese, grated
- $\frac{1}{4}$  cup chopped parsley
- 2 tsp. lemon zest

### Step by Step:

Sauté onion in butter until translucent. Add rice and sauté until all grains are coated with butter (5 to 6 min.). Add salt and 8 oz. beer. Stir until liquid is absorbed. Combine and warm the remaining beer and chicken broth. Do not boil. Add to rice one cup at a time. Stir. Wait until liquid is absorbed and then add more liquid. Do this until all the liquid is finished (this should take 20 to 30 min.). Add Parmesan cheese. Stir in parsley.

### Scottish Ale Cake

Dense, rich, and enticing, this is the perfect ending to your celebration dinner. The cake can be made ahead and refrigerated or frozen. It actually improves with age. Frost and garnish it the day of your party.

### Cake Ingredients:

- $\frac{3}{4}$  cup canned Oregon sweet bing cherries (blackberries or raspberries can be substituted)

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CIRCLE 51 ON READER SERVICE CARD



- 3/4 cup Scottish ale (such as Skullsplitter or Bellhaven), divided into 1/2 cup and 1/4 cup additions
- 14 oz. good-quality semi-sweet chocolate
- 0.5 lb. unsalted butter
- 6 eggs, yolks separated from whites
- 1/4 tsp. cream of tartar
- 1 1/4 cups sugar
- 1 tsp. pure vanilla extract
- 3/4 cup sifted flour
- 1 tsp. salt
- 1 1/4 cup finely ground flaked oats (flaked rice or flaked wheat can also be used)

#### Step by Step:

Finely chop drained cherries and soak them in the Scottish ale. Refrigerate for 24 hours.

To prepare pans: Spray cooking spray on two 8-inch cake pans. Line with wax paper and spray with cooking spray. Set aside. Pre-heat oven to 350° F. Melt chocolate with 1/2 cup Scottish ale. Whisk in the

butter 1 Tbsp. at a time until it is incorporated into the chocolate mixture. Set aside.

Beat egg yolks with the sugar until thick and pale yellow. Add the vanilla extract. Slowly beat the cooled chocolate mixture into the eggs. Carefully whisk in the ground oats, cherries, and 1/4 cup ale. Sift the flour and salt over this mixture and gently fold it in.

Beat egg whites with cream of tartar until stiff peaks are formed. Gently fold this into the chocolate mixture. Divide between two pans and bake for approximately 20 to 30 min., depending on your oven. A cake tester should be moist when pulled out. Cool cakes in pans, then turn out and wrap in plastic wrap. Store in the refrigerator or freeze.

#### Frosting Ingredients:

- 8 oz. good-quality semi-sweet chocolate
- 3/4 cup whipping cream
- 1/4 cup Scottish ale

- 1/4 cup cherries
- 1/8 cup juice from cherries

#### Step by Step:

Melt all the ingredients together. Let cool to thicken slightly and then coat the cake with it, smoothing some between the layers. Garnish with the reserved cherries. If you desire, chop some cherries and put between the cake layers. Serve some freshly whipped cream on the side.

Serve either Scottish ale (Skullsplitter) or Aventinus Wheat-Doppelbock or chocolate stout such as Young's Double Chocolate Stout or Pyramid Espresso Stout.

To toast the new year pop open a bottle of framboise (Lindemans), peche (DeTroch Chapeau Peche), maple wheat ale (Niagara Falls Brewing, Canada), or a white beer (Blanche de Bruges).

Toast for the New Year: We wish all homebrewers and beer lovers health, happiness, and many glasses of good beer. Cheers! 🍷

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*Brewing:*

# Cutting-Edge Equipment

by Ashton Lewis

*What will homebrewing be like in the new millennium? The best way to judge what technology will be available to the masses in the future is to look at the technology used at the high end today.*

Once upon a time cars, computers, and even VCRs were affordable only for the very rich. Now they are staples of everyday life. In brewing, likewise, many of the advances in equipment made on the professional level are eventually adapted for homebrewers. So we set out to discover the newest, coolest, most high-tech new stuff. Just so we could get excited about what might come our way in the decade ahead.

## Where Brewers Dream

Do you get excited at the idea of a new addition, a new piece of equipment for your brewing setup? Well, many professional brewers get excited about new equipment, too.

The greatest place to see new equipment is at an event called Interbrau, the world's largest brewery tradeshow. It's held once every four years in Munich, most recently in 1997. It features 28 exhibition halls filled with everything a brewer could possibly want. Equipment on display relates to all facets of brewing, from water to packaging and all the other stuff needed to market beer including beer trailers, glassware, umbrellas, and very cool dispense systems.

It's sort of like going to the world's largest car show. You get a glimpse into what the future is going to be like.

When brewers shop for equipment, they look for ways to reduce production costs without sacrificing beer quality or to improve product quality. Here's a look at some of the latest equipment that really gets professional brewers' hearts racing.

## Moist Milling

Conventional malt mills are multi-roller mills with either four or

six rollers and have vibrating screens to sort coarse grits, which gets milled again, from fine grits, which passes through the mill into the grist hopper. Although wet mills that moisten malt prior to milling have been on the market for at least 20 years, they haven't found widespread acceptance for numerous reasons, especially sanitization.

Today, most new milling installations in large breweries use some form of "conditioning" or slightly increasing the moisture content of the husk prior to milling. Steam conditioning is very often added to conventional systems to soften up the husk and minimize damage during milling. The advantage of this method is that a tighter mill gap can be used without further beating up the husk integrity; this results in a better extract yield from the malt.

After some nice R and D work, brewery engineers determined that conditioned mills work well with only two rollers, like mills used in small breweries. This cuts the cost of the mill without sacrificing performance. Furthermore, when the grist from these mills is mixed with the mashing water and pumped into the mashing vessel from the bottom (called "quiet fill"), oxygen pickup is all but eliminated. Say bye-bye to mash aeration!

Improvements in design have taken care of the sanitization problems associated with earlier wet mills. These gems can be fully cleaned in place; in brewer's jargon they are fully CIP-able.

In practice, beer made using this milling and mashing-in method has a cleaner taste and ends up with a higher extract yield. That earns two marks on the shopper's list for reasons to buy.



## Baffle-Less Mashing

Mashing sounds simple because it is! Add malt and water, stir, heat, wait, heat, wait, check iodine reaction, heat, and transfer mash to lauter tun. That's it.

The problem with this is that engineers designed a system, called the mash mixer, to efficiently transfer heat from steam to the mash. Being the resourceful lot that they are, engineers used baffles and high agitator speeds to accomplish their engineering goal. No doubt, baffles and high agitator-tip speed help to increase heat transfer, but these measures also aerate the mash and increase shear damage to malt particles (sort of like a blender does to an ice cube), which in turn increases wort collection time.

Today's mash mixer is designed without baffles. It comes equipped with a specially designed agitator that gently moves the mash from the center of the mash mixer and up across its outside to maximize

heat transfer while causing very little shear damage. Oftentimes the mixer is positioned off-center to create a natural vortex breaker.

Recently, one brewhouse equipment manufacturer came out with a mash agitator that moves up and down to allow adequate mixing with

### What's a Mash Filter?

Conventional mash filters have been around for about 100 years and look very similar to a plate-and-frame filter used for beer filtration, only larger. Mash is pumped into a mash filter, and the bed is sparged by pumping sparge water through the grains to rinse the sugars. Grain removal is accomplished by opening the filter up and letting the grains fall into a basin.

even lower agitator speeds. The sales features here are shorter wort collection times (better efficiency) and less wort aeration.

Homebrewers take note: Hot-side aeration research has been conducted largely by brewing equipment companies, possibly to give brewers a reason to buy new equipment. In any case all commercial brewing equipment is designed to minimize hot-side aeration just in case the customer is worried about the potential associated flavor defects.

### Super-Efficient Wort Collection

The industry standard is still the lauter tun, although many breweries use mash filters to separate wort from grain. Today's lauter tun uses a "quiet fill" that brings the mash into the vessel at the level of the false bottom. Older designs simply dumped the mash in from the top.

The modern lauter tun also is conspicuously designed without a wort collection grant. Although

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CIRCLE 3 ON READER SERVICE CARD



symbolic of wort collection and things "cool" in the brewhouse, grants — small vessels used to inspect the wort being transferred for lautering— have gone by the wayside because they are hard to clean in place and usually splash the wort.

Grants have been replaced by automated valves and pumps controlled by PLCs (programmable logic controllers), giving the brewer the grant-less lauter tun. This means easier use, less brewhouse labor and, perhaps, better beer. As recently as five years ago brewers were chatting about "airless" grants designed to eliminate air. Today the airless grant is already obsolete!

Advances in lauter tun automation, design, fill time, and grain-out time have made it possible for one German equipment manufacturer to run its lauter tun 15 cycles in one 24-hour period. Most breweries are able to turn a lauter tun six to 12 times per day

depending on the type of beer they brew and on the depth the grain bed. Now that's maximizing productivity!

For brewers fond of mash filters, the Mash Filter 2001, made by a Belgian company, actually squeezes the mash bed with inflatable air bags. This device has received lots of press for almost 10 years, because it is such a change from traditional brewing technology. Many well-known breweries use this technology, and the reported results are very high extract yield, drier spent grains, and shorter wort collection times, all without sacrificing beer quality.

### Explosive Wort Boiling

How can wort boiling be improved? After all, it's so simple. Well, when beer quality is at issue there is always a slightly better design. The new hype in brew kettle design is specially designed wort spreaders that fit on top of the large internal heating elements, called

internal calandrias, used in kettles with capacity that is more than about 50 beer barrels (1,550 gallons).

An internal calandria is basically a large shell-and-tube heat exchanger, or a bunch of tubes wrapped by one great outer shell that carries steam. The resulting boil is explosive. To keep the wort in the kettle, a spreader device that looks like a cone-shaped hat is normally placed above the calandria and a few inches above the wort level.

Spreaders evenly distribute a very thin film of wort over the surface of the boiling wort. This action keeps the wort in the kettle as well as knocking down the foam and increasing wort evaporation because of the increased surface area. In industry lingo the spreader is called a "China hat" because of its distinctive shape (all breweries use essentially the same design).

A novel kettle design introduced early this year holds wort in a

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whirlpool vessel while it is continuously pumped on top of a cone-shaped, steam-heated device positioned on top of the whirlpool. The wort boils in a very thin film, runs to the edge of this device, and flows back into the whirlpool through a tangential inlet.

The boiler is very similar to thin-film evaporators used in the food industry and reportedly saves a lot of energy and time (the wort is ready to be cooled after a very brief rest in the whirlpool, because the whirlpool "whirls" while boiling) without negatively affecting product quality.

## High-Tech Trends

Other advances include a trend toward continuous yeast propagation, greater acceptance of centrifugation as a means of yeast removal, and the use of infrared scanners to detect damaged bottles and to check fill height in bottles on high-speed bottling lines. These in-line scanners are especially slick

because when a reject is detected it is automatically pushed off the bottling line into a reject pile.

Of course any design that reduces energy consumption or recovers waste energy is extremely important in the modern world, and there are many systems designed to recover energy from wort boiling, wort cooling, and refrigeration units.

The most obvious trend, however, is automation. The definition of an automated brewhouse has changed dramatically over the past 10 years. It used to be that any system with a computer strapped onto it with some automatic valves was considered automated. Today, automated systems have control screens with terrific graphics and pull-up windows that allow the brewer to easily interface with the automation package.

Software that catalogs and graphs all outputs from instruments and indicators gives an incredible record of all activity in the brewery.

The programming logic used in the better control systems frees the brewer from mundane duties and significantly increases process consistency. The buzz word with automation people is a "lights out" brewery where people are really not needed anywhere but the control room. Many brewers aren't ready for that just yet!

The take-home message is that technology is rapidly changing the way beer is made but hopefully with minimal change to the beer itself. Homebrewers have it great because experimentation is much easier on a small scale. If you get a wild idea that no brewer has tried, go for it! Who knows, the next million-dollar idea might come from your home brewery! ■

*Ashton Lewis is brewmaster at Springfield (Mo.) Brewing Co. He holds an MS in brewing science from the University of California, Davis, and is BYO's technical editor.*

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# Make Your Mixes Match

by Alison Crowe

**O**il and water just don't mix. It's a phrase used to describe incompatibility. There are winemaking equivalents of this. Many physical, chemical, and biological properties don't interact well. This can wreak havoc while you are sanitizing, fermenting, or just storing your wine. It's important to be aware of and avoid these incompatibilities in winemaking.

## Chlorine and Corks

Chlorine is great for sanitizing drains, floors, equipment surfaces, and countless other things. Keep in mind, however, that you should never let chlorine touch a cork or a wine that might be corked. It's important to avoid contact, because an offensive odor called trichloroanisole (TCA) can develop in wine when the molds naturally present in corks (and sometimes even on winery surfaces) come in contact with chlorine.

TCA can be detected by the human nose at minuscule concentrations, and once it's in wine, there's no way to get it out. The only way to reduce the chances of getting TCA in your wines is to practice good cork-handling techniques (keeping them clean, dry) and to reduce the amount of chlorine that might come in contact with your musts and wines. Use caution and common sense; re-evaluate your winemaking procedures for their potential to introduce chlorine into your wines. Chlorine bleach and chlorine-containing cleaners and sanitizers shouldn't be used, for example, to flush out a bottling line or to clean a barrel.

Chlorine and chlorine-containing solutions are fine to use if the chlorine is going to evaporate into the air as chlorine gas or if it will be

rinsed out with a ton of water before any wine (and as a result, any cork) touches it. Don't use corks on your wine? You're still not safe. Molds in the air and on your winery surfaces can still form TCA and leave you with stinky wine. The only way to avoid this situation is to use your head when using chlorine and to try out some other cleaning and sanitizing options such as TSP, soda ash, acids, and sulfites.

## Chlorine and Stainless Steel

Again, chlorine is great for sanitizing stainless steel tanks, drums, and kegs — provided you flush them with lots of water. Chlorine and chlorine-containing products, when used correctly, can be an effective part of your sanitization regimen.

However, chlorine concentrations of more than 200 milligrams per liter pit stainless steel tanks, kegs, instruments, and fittings, damaging them forever. Mixing chlorine and acid (or rinsing chlorine with acid) causes corrosion and is dangerous.

Always look on the label of any chlorine-containing sanitizing solution that you buy (or call the toll-free number, if one is listed on the label) to determine the safety margin of that product.

## Chlorine Bleach and Ammonia

Chlorine bleach should never come in contact with ammonia or ammonia-containing cleaning products. When mixed, chlorine bleach and ammonia produce noxious gas, creating a potentially hazardous situation.

If you can't predict the compatibility of two or more cleaning products, the safest path is not to mix them and to give every surface or item a good rinse with plenty





of fresh water before a second solution is applied. For example some winemakers really like the cleaning power of soda ash and citric acid. However, if you mixed them together in a bucket before you attacked a small stainless steel hand press, they would neutralize each other and cause a potentially harmful chemical reaction. To take advantage of the qualities of both, loosen grit and grime with a solution of soda ash and water, rinse well, apply a solution of citric acid and water, and then rinse again.

## Aluminum and Wine

Time was when winery fittings were made out of whatever metal was cheap, serviceable, and available. Copper, aluminum, and bronze are just a few of the metals that have been employed by winemakers over the years. Whereas some metals might have their places, especially when tradition dictates, aluminum is certainly not one of them. Fermenting or storing wine in

aluminum vessels has been shown to cause a host of problems for winemakers.

At wine pH, the solubility of aluminum into juices and wines is significantly increased. Dissolved aluminum rapidly turns sulfur dioxide into hydrogen sulfide, creating an objectionable odor that ruins wine if it is present in sufficient quantity. At levels of dissolved aluminum exceeding five milligrams per liter, hazes and undesirable changes in flavor, color, and aroma can result. The best way to avoid all of this hassle? Never buy aluminum fittings, vessels, or instruments if there are other options available. For winemaking the more inert a material is, the better.

## SO<sub>2</sub> and Silicone Bungs

If you're lucky enough to have a sulfur dioxide gas delivery method for your home winery and you've invested in a couple of barrels, take special note of this incompatibility. While gassing one's barrels is a great way to keep empties free of microorganisms and ready to go for

next harvest, never bung up a freshly gassed barrel with just a silicone bung. Sulfur dioxide gas will harden and crack the silicone it contacts, creating a perfect environment for microbes to hide out in as well as completely ruining the resiliency of your bung.

The solution is to keep a protective layer between the bung and the gas inside the barrel. Waxed paper cups, Dixie cups for example, work very well for this purpose. Simply place your bung inside the cup and then put the whole contraption into the barrel as usual. Your barrel still will be closed tightly, but the gas will not damage the bung.

The above suggestions will save time, money, and heartache while increasing the chances that your winemaking — and your wine — will work for you, not against you. ■

*Alison Crowe works at Byington Winery & Vineyards in Los Gatos, Calif. She has a degree in winemaking from the University of California, Davis.*

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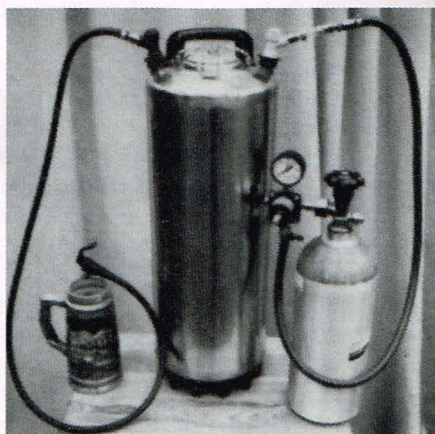
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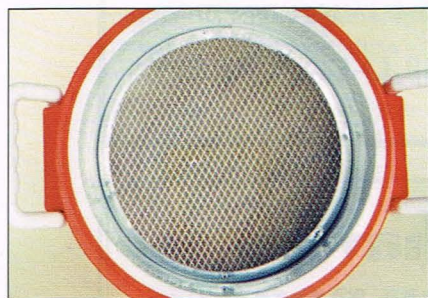
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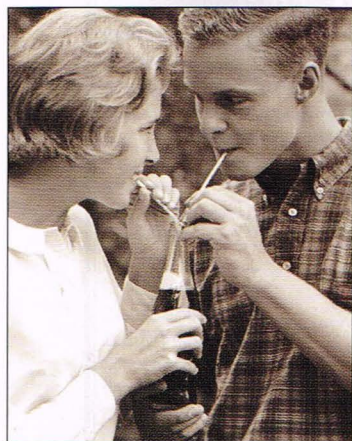




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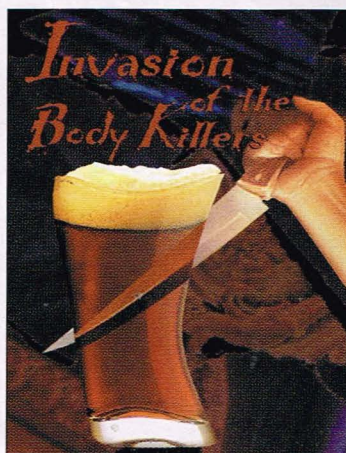
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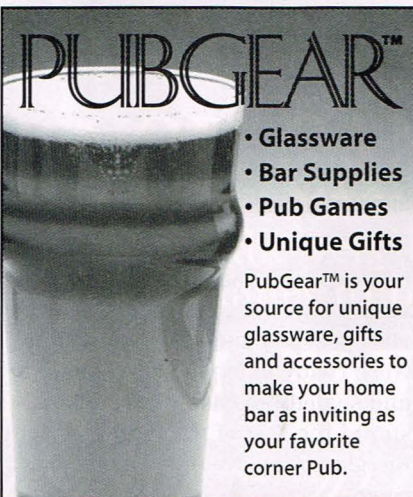
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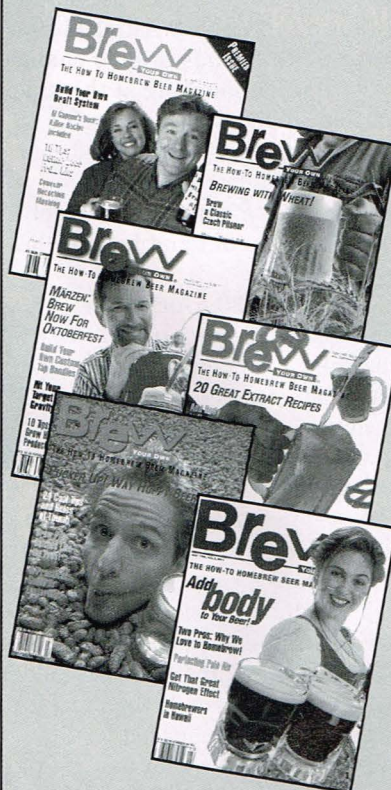
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# Diary of a Mad Brew

by Scott Byerly

**S**ometime in November: Even though I have made a very nice orange honey ale in the past for a seasonal Christmas brew, last year I felt it was time to change my recipe. Not knowing at the time that this batch would soon come to be known as the "Hades Holiday Brew," I formulated what I thought to be a killer spicy winter brew and went out and bought the ingredients.

**November 20:** During the brewing of this particular batch everything went smoothly, and the final product was encouraging. However, it was at this point that the beer metamorphosed into some sort of evil entity.

**November 29:** After setting up all the necessary equipment to bottle, I carried the carboy out to the back porch to transfer the beer. When I carefully set down the carboy on the deck, the glass exploded. In a matter of seconds the batch of beer I diligently prepared for hours was gone and I was left holding the handle in complete disbelief.

My wife witnessed the event and, as she rushed to the back porch holding back her laughter, she asked what happened (even though the only thing that was on her mind was that she was glad this didn't happen in the kitchen). I thought it was a crack in the carboy, but I later found out it was the "evil beer spirits."

**December 5:** Being foolish, stubborn, and fearful of not having a holiday brew, I decided to attempt this batch again. I bought all of the ingredients and was determined to make a great beer. The brewing went off without a hitch, and I put the beer in my extra carboy to ferment.

**December 13:** After waiting for fermentation to end, I decided to

bottle the batch. I carefully moved the carboy out back to siphon with no problems. I bottled half the batch and put the other half in two five-liter kegs (the plan was to drink the keg on Christmas). The mischievous spirits lay dormant on this day.

## Week of December 13 to 20:

While going to work out in my basement one day I noticed broken glass all over the floor. Since my "brewery" is under the stairs and connected to the workout room, I knew where the glass came from. I then noticed that the floor was dripping wet. Several bottles of beer

to tap one of the kegs so I could at least drink some of the beer.

Prepared for the worst, I took the keg outside on the grass. I slowly tapped the keg and a great burst of pressure and foam was released for about a second and then stopped. I thought to myself that wasn't so bad.

I bent down to place the tap and was slapped in the face with a stream of foam and beer. I stepped back and saw a flow of beer shoot about 10 feet in the air for about 20 seconds. When this subsided I went to tap the disfigured keg and, of course, I tried the beer. It was much better than I thought it would be. It was a little flat, but I could just tell people it was a "cask conditioned" ale.

However, this was not the last "evil" event of the day. While watching television that night, my wife and I heard a loud crash in the kitchen. We both went to see what happened, and we discovered that another bottle of beer had exploded all over the kitchen (I put one bottle of beer per batch in my showcase in the kitchen). While cleaning up we both discovered what a large mess 12 ounces of beer can make.

To this day I have no idea what caused such pressure in the bottle, kegs, and carboy. It could have been a bad strain of yeast, too much carbonation, or a chemical reaction (if fermentation had not ended). All of those explanations would seem reasonable, but I still think some evil fiend possessed my beer. Maybe Agents Scully and Mulder should be called upon to better investigate the situation. ■

*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.*



*The "evil" beer was so possessed that it bent two mini-kegs.*

had exploded, and glass was everywhere. I also observed that the kegs were warped and looked as if they were ready to explode. I cleaned up and sealed the case where I had stored the rest of the bottles so that the glass would not fly across the room.

**December 20:** Since I figured that this batch was a bust, I decided



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