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December 1995, Vol.1, No.6
Niche Publications Inc.

HOLIDAY
ISSUE

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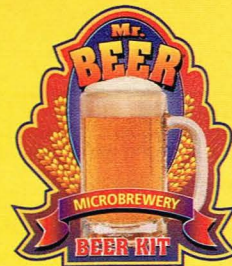
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There's an easy-to-read freshness date on every Samuel Adams.

cation of the brewing community on consumer legible freshness dating.

I hope consumers support the following microbreweries. You can help push for industry-wide freshness dating by calling your favorite microbrewery and urging them to include clear, uncoded freshness dating on each bottle. You'll be doing microbrew drinkers everywhere a favor.

Boston Beer Company, Atlanta Brewing, Broadway Brewing, Brooklyn Brewing, Bohannon Brewing, Casco Bay Brewing, Catamount Brewing, Chicago Brewing, Crested Butte Brewery, Frederick Brewing, Lowell Brewing, New Belgium Brewing, New England Brewing, Old Dominion Brewing, Old Marlboro Brewing, Otter Creek Brewing, Pavichevich Brewing, Potomac River Brewing, Redhook Brewing, Spring Street Brewing, Sudwerk Privatbrauerei Hubsch, Summit Brewing, Wynkoop Brewing.

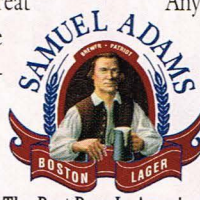
If we have forgotten any breweries that employ consumer friendly freshness labels, please send samples of the labels (so we can include them in any future lists) to: The Boston Beer Company, 30 Germania Street, Boston, MA 02130.

Our industry exists because we take such pride in the quality of our beer. We use better ingredients, and take great care to brew our beers. Don't we owe it to our customers to be honest about the freshness of our beers?

I believe all microbreweries should join the Boston Beer

Company and the other microbreweries listed here in insisting on freshness dating.

Anything less would be incomprehensible.



James Koch

Brewer/President
Boston Beer Company,
Boston, Mass.

If you can find the freshness dates on these labels, we'll buy the next round.



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Holiday Traditions

I confess that when I was a kid I was never taken with the whole love, joy, peace thing of the holiday season. You know, people acting nice for a change, professing their love and appreciation for each other, becoming filled with the spirit of giving.

That was nice and all, but I was too preoccupied with the main component of the season, at least between the ages of three and, oh, 15 or so. I was filled with the spirit of receiving.

December was the season of cool presents: one year a great construction set, one year electric trains, one year a ping-pong table. Very fun, very satisfying. Enough to fill a kid with joy and all the rest of that stuff.

Of course there was always the dark side of receiving presents. Polyester pants from Grandma and Grandpa, a flashlight from an uncle who hadn't been around in years. And the worst part was you had to write thank you notes even for those!

As I've gotten older, and I suspect I'm not alone in this, the allure of presents has dimmed. Many of my friends exchange gifts. But it can be difficult to find just the right thing for adults, even people you know well. With kids it's just a matter of figuring out what's "cool" at the moment. With adults you have to come up with something they like, don't have, and wouldn't necessarily buy for themselves. That can be a tall order.

I have a friend, Matt, who got around this problem in what I consider an ingenious way. For years he had trouble deciding what to get for his father, Dana, who is in his sixties, relatively well off, and doesn't have any specific hobbies that lend themselves to gift giving.

Then one year Matt bought Dana a homebrewing kit. Matt had told him about his own brewing and his dad seemed interested. That was enough. Matt jumped on the idea and headed to the homebrew store.

It was a success. The first time he brewed, Dana called Matt to ask

whether it was okay to use tap water, how much of a boil he should have, how to add the hops, how to cool the wort. The result was a good amber ale.

After that whenever they got together Dana wanted to talk brewing. They traded brewing books, combed the Internet for information, even looked for a brewing club together.

The following Christmas Dana's present to Matt was a case of Pale Prodigy, a pale ale with a nice flavor of all-spice. Matt took the challenge. The next year he gave Dana a raspberry-flavored ale. Dana gave him a doppelbock.

Year three Matt made a wonderful lager with a subtle ginger flavor. Dana surprised Matt with a barleywine he had made nearly a year earlier.

Now, they have each begun brewing two batches at once and giving individual bottles to other friends as presents. It's amazing how the number of people they exchange gifts with has grown.

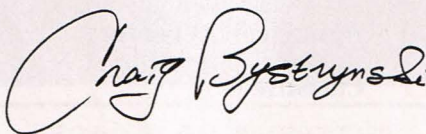
If you want to start your own holiday brewing tradition, check out three articles in this month's issue. Sal Emma's collection of winter brew recipes (page 42) includes an ale flavored with orange and cocoa and another seasoned with anise and mint. Jeff Frane's Style of the Month column (page 21) examines barleywine.

If you're looking for fun non-beer gifts, David Weisberg suggests a host of presents ranging in price from a few dollars to \$1,200 brewing systems.

Take a look. You might make somebody (yourself, perhaps!) very happy. It sure beats a ceramic turtle for the knick-knack shelf.

And of course a subscription to BYO makes a great gift (*we'd* appreciate it). There's a mail-in form on page 71.

Happy holidays, and happy holiday brewing, from all of us at BYO.



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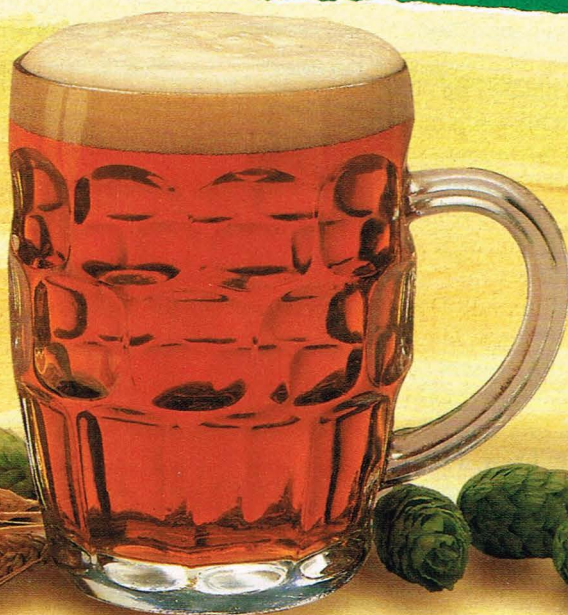
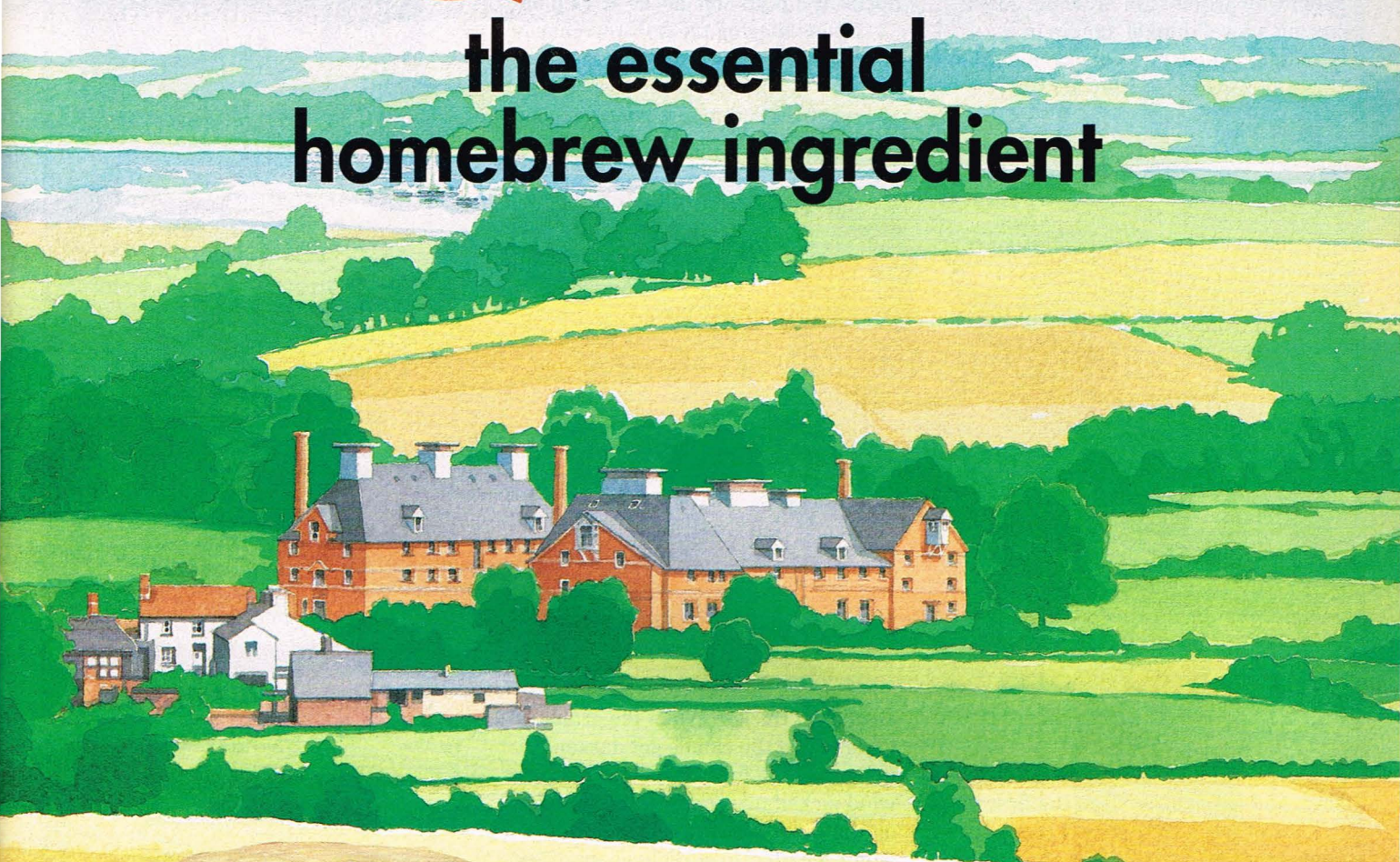
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Byron Simmons Payson, Ariz.

I just returned from a week-long trip to Austria—Vienna and Salzburg. Naturally, being a beer enthusiast, I found some areas of real interest there. I tried almost every local beer I could find. That gave me good reference points for when I am brewing! After trying a local dunkel, on tap in a gasthaus, I now know that the dunkel I brewed back in January is right on.



Don't be fooled by the modern attire—this brewery is upholding a centuries-old tradition!

One of the highlights of the trip was the Saturday afternoon that we spent in the Augustine Monastery beer hall in Salzburg. Beer is brewed and sold by the monks for the monastery's income. In this part of the world beer is a way of life and considered one of the basic food groups. The beer hall opens at 3 p.m. and closes at 11 p.m.

Upon entering the hall you choose your drinking mug from a large cabinet containing three sizes of hand-made pottery steins: .3 liter, .5 liter, or 1.0 liter. After choosing a mug you may heat it in a hot water tank (as many of the older gents were doing) or you may chill it in a cold water tank.

After that you proceed to the cashier and pay (\$2 to \$3.20). The cashier gives you a receipt that you present to the monks along with your mug.

A monk draws your beer from an old fashioned wooden barrel. With beer in hand you

go on to one of four salons to drink and converse with friends and neighbors.

Halls such as these have been run by the monks for centuries. In them conversation, discussion, and study have taken place throughout history. It would be a good bet that it was in a hall like this that Martin Luther discussed his ideas for the reformation.

Legend has it that Luther carried his bible in a wooden box equipped with thimble feet to avoid getting beer on the pages of the Bible while it was sitting on a beer hall table.

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Brewing Up a Storm

After three years of extract brewing, and inspiration from the first three issues of *Brew Your Own*, I thought I was ready to try my hand at making my first batch of all grain beer. I drilled hundreds of holes in the mash tun, talked my wife into buying an outdoor propane burner (so as not to heat up the house in the middle of our hundred-degree summers), and went to the homebrew store to buy all the ingredients.

Being a native Californian, I knew better than to start during the heat of the day, but by 3 p.m. I was too anxious to wait any longer. It was September 1, and the temperature was 103° F in the shade (normal for that time of year).

As I set up all the equipment I thought the clouds rolling in were nice—they'd help cool things down a little bit. As the water started to boil the

clouds got thicker. When the grains were added the clouds got darker. At the end of the first 20-minute rest, the wind picked up. The weather forecasts on the radio kept bragging about the sunny weather in store for Labor Day weekend. Well, by the time the mash got to 154° F the sky had opened up and I was standing out on my patio in the middle of a torrential downpour, trying to put up an umbrella to keep the rain out of my mash. I don't care what the song says, it did rain in Southern California. And nobody warned me.

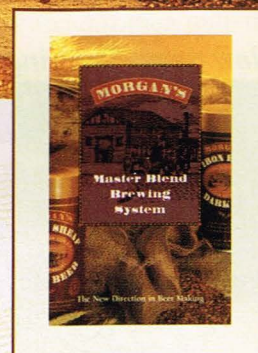
Things finally cleared up, and the wort stayed pretty dry. After a week and a half in the bottle, the preliminary taste test was pretty favorable. At least it was easy to think of a name for my first batch of all-grain brew, Thunderstorm Amber. I just hope this doesn't turn me into a fair weather brewer.

*Matthew Taylor
Grand Terrace, Calif.*

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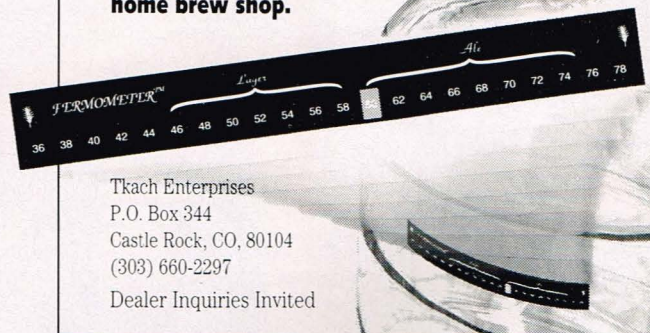
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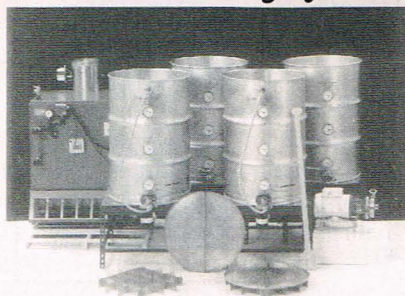
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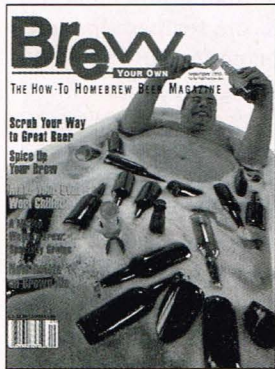
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An Upright Bottle in the Inkblot?

Dear Brew Your Own,

I was intrigued by the comments you received on the September cover. In psychology your cover would be



called a projective technique, like a Rorschach ink blot. The principle is to present an ambiguous stimulus and people see what they want. This raises an

interesting question about your readership, not to mention your former marketing director. One must wonder,

of course, whether the perceptions of those readers may have been under the influence of a homebrew or two.

The cover could also be considered a subliminal message of the sort introduced into movies decades ago. That, of course, has been prohibited by the government, though fortunately not so with homebrew. How clever of your former marketing director to dredge up that old ploy! How, exactly, do you feel about magazine sales, Mr. Rank? Perhaps you would like to tell me about your mother?

As for me, I see bottles, just bottles, lovely brown and green bottles, and a cute little ducky. And, nothing else. Frankly, I hadn't noticed the model at all. Oh yes, I see now. My God, that is disgusting! Shame on you!

Of all the advice I have given or received over the past decade, I like Charlie Papazian's the best: Relax, have a homebrew!

Douglas A. Green, Ph.D.
Destrehan, La.

Dear BYO,

Y'all didn't really fire your marketing director did you? I, too, thought the cover photo was kind of weird but

didn't notice the bottle placement until you pointed it out. Give the guy his job back. Every issue's cover, to date, has been very creative.

Your latest issue on beer in space was out of this world! I work at the Kennedy Space Center and was absolutely thrilled to see some of my coworkers' names (and faces) grace the pages of BYO. Out at the Space Center we've got a great sense of humor, and that picture of the astronaut in the MMU (Manned Maneuvering Unit) with the carboy has gotten quite a few laughs.

Bryan Holda
Port St. John, Fla.

Clearly Satisfied

Dear BYO,

I agree with most of what was said in the articles about homebrewers not needing to worry about the clarity or brilliance of their beers (Tips from the Pros, October BYO). However, I believe that it is worth mentioning that if you do achieve it, it sure is a great feeling!

I've been brewing for about 3 1/2 years now, and I never bothered much with clarity and filtration until the past

HOW TO REACH

Brew

YOUR OWN

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He's Baaaaaa-aaaack

The evidence is in, the deliberations are done, and the verdict is out. Steve Rank, former ex-marketing director of *Brew Your Own*, is back in the saddle.

He had been accused of designing the September BYO cover, "Reclining Nude" (pictured above), supervising the photo shoot, then personally delivering the art to the printer—without the knowledge or participation of any other BYO staff member.

The cover drew heat from readers who complained about the image itself, the poor sanitation practice depicted, even the use of a few green bottles in the tub. Rank's "firing" was announced in the October BYO.

His cause was aided by an outcry among BYO readers, including one or two who wrote to say they liked the cover.

Okay, the truth is he was never actually fired. We were kidding! Either that or it was a shameless attempt to divert heat from the publisher, CARL LANDAU, and the editor of *Brew Your Own*. However, the editor most



Former ex-marketing director Steve Rank (second from left) gives the thumbs up at a party announcing he is continuing with BYO following his non-firing.

likely had absolutely nothing to do with it. There's certainly no evidence that he did.

In fact it was Publisher CARL LANDAU who personally authorized the cover, supervised the photo shoot, and delivered the art to the printer late at night when nobody else was around. At press time no word was available on LANDAU's status with the company.

—The Editors

year. We once had a carboy full of beer that if you looked through it, you could see the kitchen window on the other side. There is a lot of personal satisfaction in being able to reach this level of clarity with homebrew.

We always use Irish moss, a strain-er, and a filter—just the small one that fits over the mouth of our funnel. That gets most of the “stuff” out of the beer. The wort chiller also has a fine mesh over the end that hits the beer before it is brought through the system and deposited into the carboy.

One final note: We noticed that with all-grain recipes, letting (the wort) set for about 15 minutes in the brew kettle before filtration caused most of the sediments to settle out right in the brew kettle.

*Mike Shellito
Boston*

Jack o' Lantern Juice?

Dear BYO,

In the story on pumpkin beer (In Search of the Great Pumpkin, Novem-

ber BYO), the author makes no distinction between a pie or cooking pumpkin and a Halloween carver. The latter has been bred for thin skin and little pulp rather than flavor and quantity of meat.

I don't know what a difference it might make in a pale ale but suspect it would be considerable.

*Chuck Hancock
Boise, Idaho*

Thanks, But We Want More!

Dear BYO,

I would like to express my appreciation for your inclusion of the detailed plans for the keg and bottling system in the most recent issue (Build a Counterpressure Bottle Filler, November BYO). I hope you continue to provide plans and materials lists.

Several earlier issues gave descriptions of apparatuses that I found interesting, but without detailed plans and diagrams, it is hard to visualize what the inventor is talking about.

*John Howard
St. Louis*

Dear BYO,

I have just finished reading the Style of the Month column (Make Your American Pilsner a Classic) in your October issue. This is a wonderful feature of your magazine!

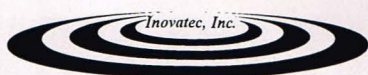
As a suggestion, some reference to the alpha acid content of the hops you are suggesting in the recipes should be included. The recipe for the 1900 Lager (all-grain) suggests 2 oz. of Northern Brewer in the boil for one hour. Assuming a conservative alpha acid content of 7 percent for Northern Brewer, this works out to an expected 56 IBUs! Wow! This ignores any possible contribution for the Mt. Hood or Saaz added later in the boil.

Since this column is intended to discuss various styles of beer, some discussion of target IBUs and alpha acids of proposed hops should be included. It would also be nice to have a target original gravity published so we may adjust the individual efficiencies of our mash/lauding systems.

*Richard Hunter
Atherton, Calif.*

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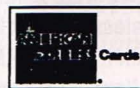
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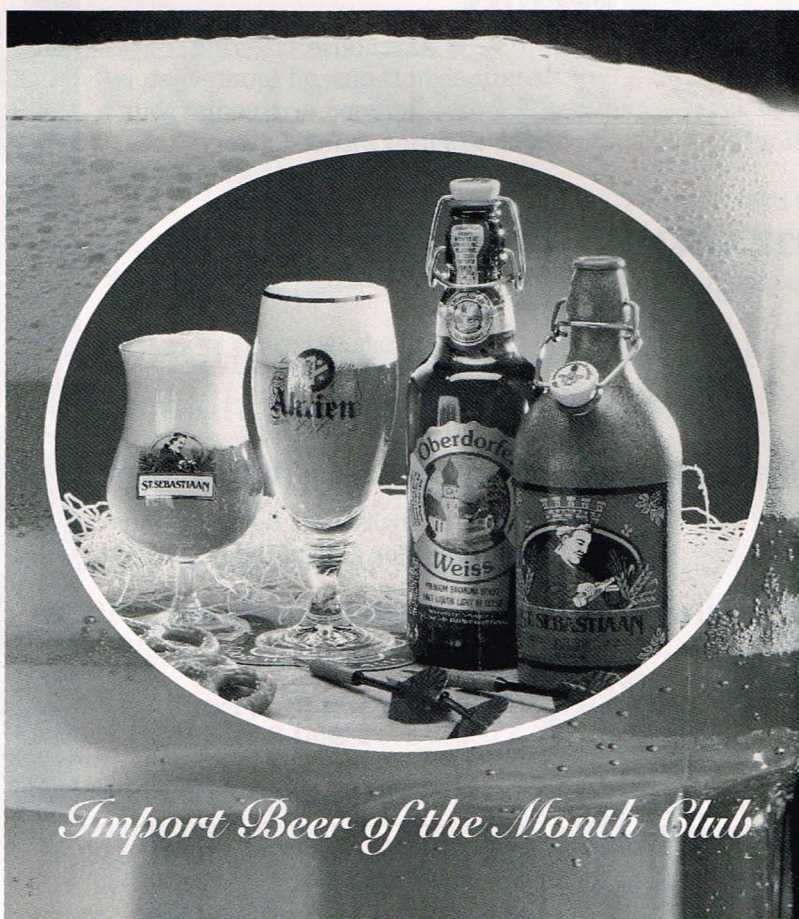
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The Aftermath of a Steamy Encounter



Mr. Wizard

I have been to San Francisco and enjoyed the famous steam beer. I recently brewed a batch from a kit, and my tasters pronounced it to be excellent. The only steam involved was from the boiling wort.

Is steam only a gimmick, or is it somehow used by the Anchor Brewing Co. in processing their products?

*Jack Elliot
North Reading, Mass.*

Congratulations on brewing a quality batch of steam beer! I also like that style, although it has been officially named "California Common" due to the trademark on the name "Steam."

You've asked one of those wonderful brewing questions that has no true answer. According to covert operatives snooping around at the Anchor Brewery, there are a couple of possible explanations for the name "Steam," and "marketing gimmick" is not one of the possibilities.

In the old days of California brewing, refrigeration was not a feature of brewery life. These breweries were producing lagers, which were the hip

beers in the late 19th century, but fermenting them a little warmer. They were quickly taken out of fermentation and kegged. This was necessary to keep the beer in good condition, since lagering requires long, cold storage.

Apparently these kegs built up quite a bit of pressure (perhaps due to their warmer-than-freezing serving temperature) and let out a hiss of "steam" when tapped. Michael Jackson points out in his *World Guide to Beer* that this explanation was documented by the *Western Brewer* in the 1890s.

Another story I have heard has to do with the San Francisco fog. Traditionally, steam beer was kept cool by allowing the San Francisco air to roll into the fermentation cellars housing large, shallow fermenters. This brewing method exposed a large surface area of beer to the chilly morning air and helped the breweries keep fermentation temperatures cool. Perhaps the cool San Francisco fog looked like steam filling the cellars and prompted the name "steam" beer.

Some breweries in other parts of the world have used the name "steam beer" or "steam brewery" to signify the use of steam engines in the brewery. This association has never been made with San Francisco steam beer. I wonder if the rough San Francisco crowd of the late 1800s found their local beers particularly intoxicating and called them steam beer because they caused one to become "steamed."

Whatever the origin of the name, the speculation can become part of the enjoyment of steam beer.

Mr. Wizard

Since I am in the process of moving, I won't inaugurate my personal brewery until December or January. I am very naive, and I selfishly hope that my first attempt will produce an excellent brew. I do have some questions:

1. Some beers have a noticeable aftertaste, such as Samuel Adams and Sierra Nevada. What ingredients do I need to reduce in the preparation of my beer to eliminate the aftertaste? I prefer lighter beers such as Beck's, Steinlager, or Heineken.

2. I understand that the alcohol content of European, Australian, and New Zealand beers is much higher than the beers brewed in the US. Is it possible to brew a stronger drink without sacrificing quality or taste?

3. How does Coors boil their wort at such a high altitude?

*Terry Burgess
Las Vegas, Nev.*

When you drink Sam Adams and especially Sierra Nevada, the aftertaste in your mouth is hops. The beers you prefer tend to have less hops, which makes sense. To reproduce this at home you need to be mindful of both bittering and aroma hops. Bittering hops are added early in the boil and provide hop bitterness to beer. Aroma hops are added later in the boil and give beer a spicy, floral, hoppy nose. Your favorite brands have moderate bitterness, around 25 IBU, but not much hop aroma. Sierra Nevada is fairly bitter, about 35 IBU, and has an enormous hop aroma.

If you want your first brew to be great, your job is going to be a little harder if you cut back on the hops. Really hoppy beers are able to hide their flaws a lot easier than lighter beers. If you find a recipe for a European lager or a light ale, I think you'll be pretty happy with the outcome provided that you are clean and careful in your home brewery.

As far as alcohol content influencing quality and taste, that is a personal preference issue. Quality refers to a lack of defects, consistency, and brewing what was intended. If a beer can be rated well based on this sort of criteria, then it is a quality product

regardless of the alcohol content.

Alcohol does have a great influence on flavor. Generally speaking, high-alcohol beers are more flavorful than low-alcohol beers of similar color and bitterness level. In many high-alcohol beers other flavor compounds not directly related to alcohol also become more pronounced. These include esters, which are fruity, and the fruity/spicy higher alcohols that are often implicated in causing headaches.

Many connoisseurs of flavorful beers prefer higher-alcohol beers, say those with original gravities between 1.056 and 1.072, because these high-gravity beers simply have more flavor than their lighter cousins. Personally, I like normal-gravity beers. The flavor is a little more subtle, and the hop and malt characters are featured instead of alcohol, esters, and higher alcohols.

Now I gotta go to bat for American brewers. American beer is no weaker than European or any other country's beer on average. In fact the standard-strength beers in this country are stronger than most beers in the UK.

That's why some people can slam down six pints of Guinness and feel okay but are quite intoxicated after the same volume of, say, Coors.

The confusion in all of this lies in the fact that we measure alcohol by weight in this country and most other nations use alcohol by volume. Beer that is 5 percent alcohol by volume (5 percent v/v) has the same alcohol content as beer that is 3.95 percent alcohol by weight (3.95 percent w/v). Most imported lagers are about 5 percent alcohol (v/v) and most American beer is between 3.8 and 4 percent alcohol (w/v). Essentially, there's not much difference.

About your last question regarding high-altitude brewing: As far as I know, Coors boils their wort under atmospheric pressure. At the high altitude in Golden, Colo., where Coors is brewed, wort will boil at a lower temperature than wort at sea level. It still boils, however, and wort volatiles are evaporated, hop acids isomerize, bacteria are killed, trub forms, and the wort becomes concentrated.

Although these changes are primarily due to heat, the physical agitation produced by steam bubbles rising through boiling wort is also an important factor. That means although the boiling wort temperature is lower than wort boiling at lower altitudes (it's still hot enough to scald the heck out of you!), the physical agitation is the same.

With that said, I believe that the Anheuser-Busch plant in Fort Collins, Colo., uses pressurized brew kettles so that their wort boils at the same temperature as wort in St. Louis. If you're going to be homebrewing in high altitudes you can use a longer boil, perhaps 90 minutes instead of 60, to compensate for the lower boiling point of the wort.

Good luck with your maiden brew, and read on for more about alcohol content.

Mr. Wizard

Oh Great Wizard of Wort,

I've been homebrewing for about a year. My question is: Will adding dextrose to the wort during the boil increase the alcohol content of the finished product? Also, will these small filters I see advertised keep the sediment that forms in the bottom of bottles from getting in there?

*David Ross
Mt. Vernon, Ohio*

Yes, adding dextrose to wort will increase the alcohol content of the finished beer. Dextrose (glucose), maltose (malt sugar), fructose (fruit sugar), and sucrose (table sugar) can all be used by yeast to produce alcohol, and you can add any of them to wort to boost the alcohol content. However, be careful. Adding too much can give a cidery flavor to your beer. Years ago, many kits contained high proportions of sugar and produced cidery beers. Most kits these day contain little if any adjuncts—in other words they are all-malt. So if you add sugar, don't exceed about 25 percent of the total extract. (See "Calculating Your Brew," October BYO, for information on calculations.)

As far as those little filters go, they will prevent yeast from making it into

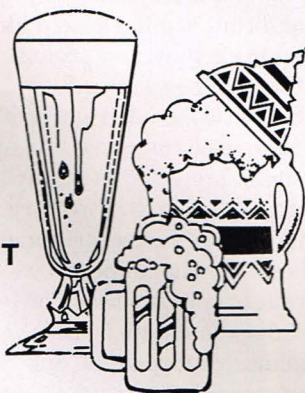
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the bottle. (That is if you're speaking of filters advertised for use with beer or wine.) Once your beer is filtered, you cannot bottle condition it, because there is no yeast present. This means you can either filter carbonated beer and counter-pressure fill the beer into bottles, or you can filter flat beer, carbonate it in a keg by using bottled carbon dioxide, and then bottle it.

Once beer is filtered and bottled, it can still look cloudy if it was filtered warmer than it is served. This is known as a chill haze. If your main goal is to avoid having sediment at the bottom of bottles, filtration will certainly do the trick.

Mr. Wizard

I've been brewing for a number of years now. I would like to know the pros and cons of fermenting in glass, plastic, and stainless steel. Would using stainless steel lessen the possibilities of bacterial growth?

*Don Kohl
Stoney Point, N.Y.*

Stainless steel is the material of choice for commercial breweries. It is resistant to cleaning chemicals, does not leech flavors into the beer, and is very durable. However, it does not intrinsically reduce the likelihood of bacterial growth. If stainless is cleaned improperly or if your wort is contaminated, then the beer will still spoil. However, stainless is easy to clean since it is a smooth surface, and that means if cleaned properly it is less likely to harbor bacteria. If you use stainless soda kegs, the fittings make cleaning a bit difficult when yeast and trub have blown up into them. This is a disadvantage to using a soda keg as a primary fermenter.

Plastics can introduce problems because they are easy to scratch. If cleaned following an inappropriate protocol, scratches can and do harbor living bacteria. This problem is solved by using non-abrasive cleaners and brushes on plastic fermenters. If the plastic is food grade, it will not leech flavors into the beer. Also, plastic is cheap and durable.

Two possible negatives with plastic

are oxygen and light. Most plastics are oxygen permeable, which means that beer can become oxidized in a plastic fermenter. This is why peanut butter in plastic jars tastes rancid within a couple of months of purchase. The old glass jars were much better for the peanut butter but were more expensive for Peter Pan and company. If the beer is transferred to a glass or stainless secondary after active fermentation ends, this probably won't be a

problem.

Light may be an issue if translucent plastics are used in a lighted room. This environment can cause your beer to turn skunky. Glass carboys suffer from the same light damage problem. The easy solution is to ferment in the dark or cover your fermenter with a box or a bag.

Personally, I like glass carboys because they are easy to work with, easy to clean (with proper brush in

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hand), and are resistant to cleaning chemicals. The biggest downside to glass carboys is that they are easy to break and *will not* hold pressure.

My system of choice is to use a glass primary and then transfer the beer to a stainless steel soda keg for my secondary, where I naturally carbonate the beer in bulk and avoid schmoos being stuck all over my keg's fittings. This system takes advantage of the strong points of these different vessels.

Mr. Wizard

In the September BYO you responded to a "commotion over respiring yeast." You said yeast don't require oxygen for respiration. Is this true? If so, this is the first time I've heard of this and it sure disagrees with everything else I've heard. What I want is multiplication. Will I get multiplication of healthy yeast if I don't oxygenate?

Guy Dent

I knew I opened a can of worms when this discussion started in our Premier issue. The fact that brewing yeast have no respiratory phase during any part of their stay in wort and beer is true. However, they do need oxygen.

Oxygen is used by yeast to synthesize sterols and unsaturated fatty acids, two important components of the cell wall. Therefore, yeast *require* oxygen for healthy multiplication. So in answer to your question, you *must* oxygenate your wort.

This is quite different from respiration. Biochemically, respiration occurs when oxygen is used by the cell as the terminal electron acceptor in the electron transport chain. When this happens, water and large quantities of ATP (cellular fuel) are produced. Yeast do not use oxygen in this way in a brewery. The terminal electron acceptor for yeast is acetaldehyde, and the product is ethanol.

As a practicing beer geek I'm always compelled to make this distinction. For us nitpickers, this respiration issue is one common misconception that always forces our big mouths to open. Hopefully this will be the last chapter in the "commotion over the commotion over the commotion over respiring yeast"! ■

Mr. Wizard's Address

Do you have a question for Mr. Wizard? Write to Mr. Wizard, c/o Brew Your Own, 216 F St., Suite 160, Davis, CA 95616. You can also reach him by fax at (916) 758-7477 or e-mail at wiz@byo.com. Visit Mr. Wizard on the World Wide Web at <http://www.ns.net/BYO>.

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CIRCLE 29 ON READER SERVICE CARD

Sanitation: Make Your Elbow Grease Count

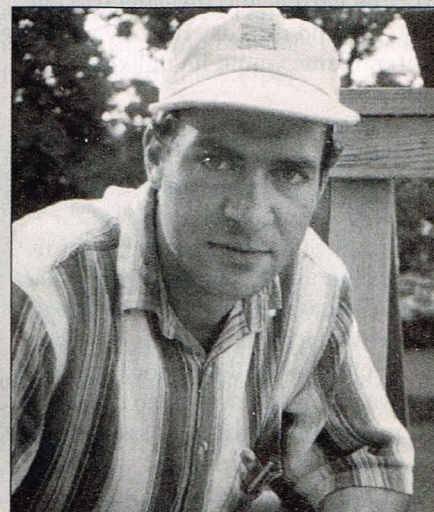
by Gailen Jacobs

The right cleaning agents and proper technique make sanitation easier and beer better. This month's pros discuss methods they use and methods you can use at home.



Kurt Widmer
Widmer Brewing Co.

"When I was a homebrewer, I put cheese-cloth over the carboy and inverted it so it could drip dry but any airborne contaminants would be unlikely to get inside."



William Foster
Capitol City Brewing Co.

"Start worrying about sanitation in your transfer, your wort chiller, and then your first and second fermenter...Whatever tool you are going to use after the boil should be sanitized."

Brewer: Kurt Widmer

Brewery: Widmer Brewing Co.,
Portland, Ore.

Years of experience: 11

Education: Five years homebrewing.

The three things brewers should not forget when it comes to sanitation are:

1. Looking clean is not equivalent to actually being clean or sanitary.
2. There's no replacement for good, hot cleaning chemicals and elbow grease.
3. Any sanitizing agent should be beer compatible. Frequently, people

use chlorine. They dilute bleach with water. These are very effective sanitizers, but they leave a residue. If you have to rinse out the residue, what is the point of sanitizing? The water could carry contaminants.

To clean equipment we use 180° F caustic sodium hydroxide. Cleaning takes off any of the proteins from the fermentation that might still be clinging to the side of the tank. The best thing available to a homebrewer is TSP (trisodium phosphate). There's nothing better than sodium hydroxide, but it's a pretty dangerous product. TSP is a good substitute.

I'm not a big fan of using acids as cleaning agents. I'm more in tune with using alkaloids such as caustic soda. I don't think acid cleansers are anywhere near as effective as sodium hydroxide.

To sanitize there's nothing better than live steam. But not every homebrewer has access to live steam. When we don't use steam, such as when we sanitize kegs, we use iodophor. We do not rinse that out—as long as you stay under 20 parts per million, then you fall within the FDA guidelines. When we rinse a tank with iodophor, we leave just the few droplets that cling to

the wall of the tank—there would be no accumulation in the bottom of the tank.

When trying to dry off some of the iodophor on the equipment, you have to be careful of airborne contaminants. We seal our tanks and let them drip dry internally. Then we drain anything out of the bottom of the tank. When I was a homebrewer, I put cheesecloth over the carboy and inverted it. That way, it could drip dry but any airborne contaminants would be unlikely to get inside.

During the brewing process there are times homebrewers need to be more careful than at others. Homebrewers should make sure that the yeast they pitch does not contain any contaminants. If you use smack packs (liquid yeast packets), sterilize the container with a quick rinse in iodophor.

Cooling is another critical phase. I always set up my system so that once the wort cools, it's in a closed vessel or a relatively closed vessel. I was never really big on the so-called open fermentation.

Brewer: William Foster

Brewery: Capitol City Brewing Co., Washington, D.C.

Years of experience: 4

Education: Courses at the University of California, Davis.

At Capitol City we have a cleaning system where we add water and about a 2 percent solution of a caustic cleaning agent to begin with. Caustic, which is either in a powdered or liquid form depending on what company you get it from, takes out organic matter or solids such as residual yeast. We follow the caustic with a quick water rinse. We follow that with an acid.

Following the caustic, acid gets rid of the beer stone (also known as calcium oxalate). Beer stone is a buildup similar to a mineral deposit. Beers sometimes leave beer stone, depending on the type of beer and how we treat the water. For example the pale ale takes a little bit harder water. It can sit in the fermenter for quite a while. You will have a little of that beer stone build-up.

We follow the acid with a water

rinse. We don't worry about water-borne bacteria, since Washington, D.C. water is bacteria-free because there is ample chlorination. We have a carbon-activated charcoal filter that takes out the chlorine. As long as homebrewers have a decent municipal water source, they shouldn't worry too much about water rinses, either. Some advanced homebrewers will filter the water supply or treat their water in some way or another. That's not often necessary.

A good rule of thumb for any commercial brewer is caustic followed by acid and water. But for homebrewing applications, TSP works well as both a cleanser and sanitizing agent. You have a small enough space that you can use your own elbow grease and reach in. When you're talking about tanks 20 feet high, you don't want to climb in there. We need to use more chemicals in higher concentrations.

TSP is a bactericide and a fungicide. It will get any bacteria, fungus, and act as a detergent. You should rinse with water after TSP.

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but superficially clean. In the boil during the mash process you use spoons and other equipment. You are sterilizing what you are using in the boiling liquid. A lot of people dip their spoons in a sanitizer before they begin to stir each and every time. I used to do the same thing. There's nothing wrong with that, but you don't have to worry that much about the sanitation during

this stage. Nothing will survive the boil.

You want to start worrying about sanitation in your transfer, your wort chiller, and then your first and second fermenter. Whatever hose, transfer unit, siphon, spoon, and miscellaneous tool you are going to use after the boil should be sanitized. You can use TSP and a water rinse for that.

One thing to be particularly careful

with is any line such as PVC hose or tubing. Hoses need to be free of crevices that can trap contaminants. Dead ends or T-clamps need to be taken apart for cleaning after each use. Longer pipe runs should be grouped in shorter circuits to avoid having difficulty maintaining proper temperature and pressure needed to remove soil during cleaning. If there are tight bends, you can also get pockets of air that won't be able to go all the way through the pipe.

The Tips

Kurt Widmer

- Looking clean is not equivalent to actually being clean or sanitary.
- There's no replacement for hot chemicals and elbow grease.
- Any sanitizing agent should be beer compatible.

William Foster

- Use caustic soda followed by acid followed by a water rinse.
- TSP works well as both a cleanser

and sanitizing agent.

- It's not necessary to be meticulous before and during the boil, but carefully sanitize any tool used after the boil.

Percy Young

- If you use bleach, rinse, rinse, rinse.
- Be extra cautious with plastic fermenters.
- Spend extra time cleaning/sanitizing transfer lines.

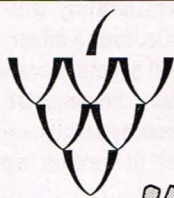
Brewer: Percy Young

Brewery: Goose Island Brewing Co., Chicago.

Years of experience: 1

Education: Siebel long course.

We use caustic soda, which is basically sodium hydroxide. This is stuff you don't really want to use as a homebrewer, because it's pretty harmful to the skin. In addition it can react pretty violently, particularly when combined with CO₂. There are a lot of cases when



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people will put caustic soda into their fermenters without bleeding off the CO₂, causing implosions. We work with a lot a safety equipment. We also do a lot of rinsing with water.

We use a food-grade phosphoric acid, which helps sanitation. Sometimes we use iodophor; you might find it called "Micro Clean." It's good but it really stains, so we don't use it often.

When I was a homebrewer, I used bleach to clean. Sometimes you can get

residual taste from the bleach in the beer. You have to rinse very well.

There are many products you can use for sanitizers, such as B-Brite and iodophors. The important thing is to follow the instructions.

One of the most difficult challenges for homebrewers is keeping fermenters clean, particularly if you're using plastic. When you examine the plastic fermenter after you've cleaned it, you have to realize that looking at it wet is

deceiving. The film of water might be hiding something underneath.

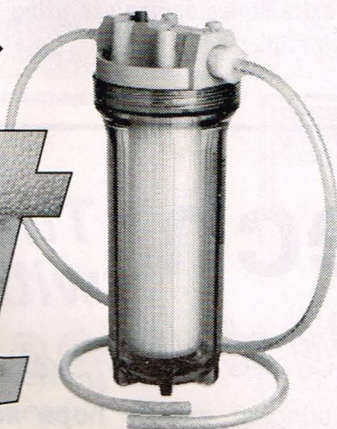
Plastic fermenters can be overused. They tend to wear down. I had a few that took dives, but I still used them. I paid for it with bad beer in the end.

There are no tricks to cleaning plastic fermenters. I learned my lesson and switched to glass. The plastic can develop nicks and cuts that hold bacteria.

Transfer lines can be another area of potential problems. With copper piping you have to be careful about how corrosive your cleanser is. The plastic tubing can harbor a lot of bacteria if they are nicked on the inside or if they stay stained. That can be a problem if you're using iodophor or something that stains—it might deceive you by hiding other build-up. ■

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Raise Your Glass

This year's Great American Beer Festival brought accolades for two members of the *Brew Your Own* editorial board, as well as several brewers featured this year in *Tips from the Pros*.

Editorial board member Kirby Nelson's Capital Brewing Co. took a silver medal in the Octoberfest category and a bronze in Bock. Dan Kahn, brewmaster of Anheuser-Busch specialty brands, took a gold for Red Wolf in the dark lager category.

From the Premier issue *Tips from the Pros*, Grant Johnston of Marin Brewing won a bronze in the robust porter category, and Steve Nordahl of Frederick Brewing won a silver for Bock.

August pro David Sipes of Sudwerk won gold for European-style pilsner. David Hartmann of Empire Brewing won bronze for German-style wheat beer.

September pro Carol Stoudt of Stoudt Brewing was awarded the bronze medal for European-style Pilsner.

Kevin Stuart, Dixie Brewing (October), won a silver for dark lager.

Geoffrey Larson of Alaskan Brewing (November) won golds for smoke-flavored beer and American amber ale, and David Grinnell of Boston Beer Co. took bronze for Märzen/Octoberfest.

This month's pro Percy Young of Goose Island received honorable mention for the brewery's Strong Ale.

Barleywine: A Beer with Brawn

by Jeff Frane

Where I live, it's cold and wet this time of year. Good brewing weather, and a good time to relax with my wife in front of a crackling fire. We have found that nothing suits a warm fire like a glass of homebrewed barleywine.

My wife is very big on traditions, particularly those involving the holidays. Sometimes they are old traditions—Christmas trees, wreaths, presents for the little nippers—and sometimes they are new. At her insistence I started brewing something for the big nippers around the first of the year, each year: a batch of barleywine.

I don't make a lot; I can only fit enough malt for four gallons in my mash tun. But even with two big nippers in the house, four gallons of barleywine goes a long way. This is a beer, after all, with an alcohol content around 8 percent to warm us on the inside while the fire warms the outside. It's not the sort of beer to serve in pints, either; as much as possible ends up in my irreplaceable collection of "nip" bottles (about five ounces) and is served in wine glasses.

Barleywine seems to be a relatively modern term, at least commercially. Michael Jackson's *Beer Companion* cites a bottle of Bass No. 1 Barley Wine, from 1903, as the first on a printed label. The term is occasionally a source of some

confusion—is it barley? Is it wine? Particularly confusing, apparently, to the US Bureau of Alcohol, Tobacco, and Firearms, which is why American versions are known as "barley-wine-style ale." Why use two words (or one) when you can use four?

A barleywine, in essence, is an ale brewed to the strength of a wine, more or less. It usually is the strongest beer a brewery produces, although Jackson notes that England's Eldridge Pope brewery makes a barleywine at about 8 percent and an "old ale" (Thomas Hardy) at around 12 percent. What distinguishes the two is less clear.

The style remains difficult to pin down. The color can range from golden or copper-bronze (Fuller's Golden Pride) to deep brown (Hart Brewing's Snow Cap). Generally, the beers are rich and malty (and almost certainly all-malt), but many of the best are balanced with plenty of bitterness. Some, like Anchor's Old Foghorn or Newport's Old Crustacean, have plenty of hop flavor as well. Some are even dry-hopped, although the long maturation times assure that the hoppy nose is subdued.

One thing to expect of all barleywines is a very estery, fruity character derived from the combination of high-gravity, all-malt grist and top fermentation.

Brewing barleywines presents some special problems, but none are insurmountable with some extra effort and a good barleywine is its own reward.

Good barleywines, like the best of any style, require good ingredients: Good malt is paramount, of

course. Malt extract can be used as a base, but plenty of specialty malts are needed for the beer's rich body and flavor.

Use lots of hops! Even a very malty version requires plenty of hops, not only to balance the sweetness of so much

malt but because the exceptionally high gravities mean an exceptionally thick wort and much poorer hop utilization.

Of crucial importance, of course, is a



solid, complete fermentation. A fermentation that stops, or chugs on for months, will produce a sickly-sweet brew—no fun in front of the fire.

Choice of yeast is also critical. It will have to be very alcohol tolerant to survive levels of 8 to 10 percent. If you know that a particular strain has been used commercially to produce a barleywine, it's a safe bet. However, bottle-conditioned strong ales are not the best place to recover brewing yeast. It's best to work from a new culture. Most ale strains have less trouble than one might expect, provided two things are taken into consideration: plenty of yeast and plenty of oxygen. High pitching rates are always important, of course, but for high-gravity beers they are absolutely essential.

I've found that the simplest method of assuring an adequate supply of yeast for a barleywine is to first brew an average-strength ale—far enough in advance that the beer's primary fermentation is complete and most of the yeast has flocculated (dropped out of suspension). Then the yeast can be transferred to the waiting barleywine wort, or the wort can be run in on top

Traditionalists
age the beer in
wooden casks
and roll them
around to rouse
the yeast.

of the yeast in the same fermenter. Another option is to inoculate the barleywine wort with a couple of pints of vigorously fermenting ale.

Although I'm generally fond of highly flocculent yeasts, such as Wyeast 1968, I shy away from them for high-gravity brewing. It's much easier to choose a yeast that stays longer in suspension and is less likely to quit in mid-ferment. Occasionally, particularly with flocculent strains, the yeast will need to be roused. Traditionalists age the beer in wooden casks and roll them around to rouse the yeast, but the rest of us can rack the beer to another fermenter or gently stir the beer to get the yeast back to work. Be careful not to splash the beer!

Lots of malt—lots and lots of malt—goes into a barleywine. A rule of thumb is that a barleywine takes a bit over twice the malt of a conventional ale. Some brewers really push the edges of the envelope with original gravities of up to 1.100, but it's quite possible (and simpler) to make very flavorful barleywines in the range of

Bind Jack Barleywine (4 Gallons) O.G. 1.090

Ingredients:

- 13 lbs. pale malt
- 3 lbs. Belgian aromatic malt
- 1 lb. British caramel malt
- 2 oz. Eroica hops (11% alpha) after 15 minutes
- .75 oz. Mt. Hood hops (4% alpha) after 30 minutes
- 1.5 oz. Mt. Hood hops after 60 min.
- 1 oz. Goldings hops (3.5% alpha) after 90 min.
- Styrian Goldings hops (5%) dry-hopped in secondary
- Wyeast 1056 American Ale yeast.

Step-By-Step:

Mash in with six gallons of water (adjusted for hardness with eight grams gypsum and .5 grams Epsom salts) at 125° F. Hold for 30 minutes, raise to 155° F, and hold until iodine test is negative (about 60 min. more). Run off all liquid. If necessary, sparge with only enough water to bring volume to five gallons. Boil for 90 minutes. Pitch and aerate thoroughly. Ferment at 65° F for four weeks. Bottle with 1/2 cup corn sugar.

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Blind Jack (Extract Version)

Ingredients:

Substitute 10 lbs. light extract for the pale malt. Mash the aromatic malt and caramel malt with two lbs. of pale malt at 150° F for 60 minutes. Sparge to the kettle and add the extract. Follow the same procedures from there on.

provided, fermentation of a barleywine shouldn't chug on much longer than a "normal" ferment. By three to four weeks the beer should essentially be finished, although barleywines gain tremendously from long maturation. Barleywines don't require much carbonation—in fact, they can be ruined by too much gas—but a little sparkle enhances the aromatics. I've found that normal bottling practices work very well with barleywines,

although care must be taken not to bottle too soon.

When the beer is done and bottled, lay it down in a cool, dark place—the longer the better. A good barleywine should gain character over several years, and the hardest can probably be counted on for a decade or more. That's why barleywines need to be brewed on a regular basis, so there will be a few bottles around 10 years down the line!

1.080-1.090 (check out Young's Old Nick).

Barleywines provide an opportunity to blend a lot of different malts—several caramel malts, toasted malt, a touch of chocolate malt. Although the largest portion of the grist is pale malt, good malt extract can be substituted for much of it. It's a good idea, however, to include some pale malt in a mini-mash with the specialty malts. Then the grains are sparged (rinsed) with hot water, and the resulting liquid is boiled with the extract.

In an all-grain mash there are several approaches to producing the thick wort. Rather than boil a normal runoff for four or five hours, boil only the first runnings from the grain and don't sparge at all. (After the initial runoff has been done, the rest of the grain can be sparged and the new runoff used for a "small" beer—depending on the volume of malt, "small" can mean a standard 1.040 ale!) I have heard of, but never tried, a method that uses the initial runoffs in a second mash, with fresh grain. If anyone has had success with this, give me a shout.

Barleywine is a fine opportunity to use super-alpha hop varieties with plenty of punch. A surprising number of commercial barleywines have been dry-hopped, with the beer aging for many months on fresh hops. For these additions and late additions in the kettle, use only the best, most aromatic hops—British varieties such as Goldings and Fuggles seem particularly appropriate.

If plenty of yeast and oxygen are

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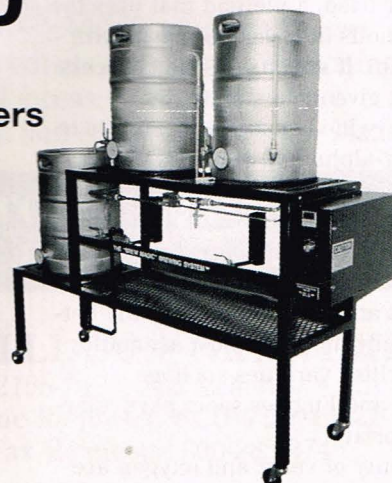
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20 TIPS: BETTER, FASTER, CHEAPER BEER

By Kinney Baughman

From the two-batch battle plan to the \$3 counterpressure bottle filler, these innovative ideas will make brewing more fun and the result more enjoyable.

It's simple. If you want to make good homebrewed beer, all you need are the best possible ingredients, the best possible equipment, good recipes, and sound technique.

The first three requirements can be met by taking a trip to your local homebrew shop or ordering from your favorite mail-order supplier. But the requirement of sound technique is satisfied only by practice, practice, practice, and by listening to the advice of other homebrewers.

You see, homebrewers are an ingenious lot. Any homebrewer worth his wort is constantly trying to improve some aspect or other of his brewing process. Just when you think you have heard it all, someone comes up with a simple yet effective tip for the brewing process that makes you slap your forehead and say, "Well, of course! Why didn't I think about that before?" Every time you add another piece of advice to your bag of tricks you enhance that last, most subjective requirement for making good beer: technique.

What follows is a quick tour of the brewing process, including tips and tricks that have been picked up from an assortment of homebrewers over the years. Some of these may be old news. Others may take you one step closer to making that perfect pint of beer.



Extract Brewing

1. Try to employ full five-gallon boils as soon as possible. Think of malt extract as concentrated wort. To make beer that rivals the best home- and microbrews, you must reconstitute the wort. That is, you must restore the concentrated wort back to its original gravity. Once you have, you can begin to treat it as wort retrieved from an all-grain mash and sparge. This is especially important for hop utilization. Yes, you will probably need a wort chiller. But the sooner you start using one, the sooner you will wonder how you ever lived without it.

2. Avoid straight extract recipes. Can you make decent beer by dumping two cans of prehopped malt extract into a pot and boiling it for an hour? Well, yes. But it will never be as good as using light malt extract, crushed specialty grains, and fresh or pelletized hops.

Craft your beers by consulting all-grain recipes. Most five-gallon all-grain recipes will call for eight to 10 pounds of pale malt, a variety of specialty grains (crystal malt for amber ales, chocolate malt for dark ales, for exam-

ple), and fresh or pelletized hops. Simply substitute two cans of your favorite light malt extract for the eight to 10 pounds of pale malt. You can boost the gravity of your wort if necessary by adding small amounts of dried malt extract. Grind the specialty malts. Place them in a mesh bag and submerge them in your water as it comes to a boil. Pseudo-sparge by dipping them in and out of the water several times. Remove them once the water hits 180° F to avoid extracting excessive tannins from the grains. Be very careful not to boil the grains. Bring the "malt tea" to a boil. Add the extract and proceed with hop additions per the recipe.

A side benefit of this technique is that you only have to buy one kind of malt extract. Therefore, you can buy in bulk or case lots and get a reduced price. This will help you save on the total cost of your beer.

3. Pre-mix liquid malt extracts with equal parts boiling water before adding them to the brewpot. This will eliminate the heavy syrup from "glopping" on the bottom of the pot, the malt

sugars caramelizing, and the subsequent burnt sugar taste in your beer.

4. Remove the brewpot from its heat source when adding malt extract. This, too, will help eliminate the possibility of scorching the malt on the bottom of your boiling kettle.



General Brewing Tips

5. Brew two batches of beer at once. The hardest part of any job is getting started, so once started, why not brew two batches of beer instead of just one?

This works well for both extract and all-grain brews. The key is to understand that most of the time spent brewing beer, especially all-grain, is spent waiting for each process to finish. So while the first batch is mashing, grind the grains for the second batch. While sparging the first batch, mash the second. While boiling the first batch,

sparge the second. While chilling the first batch, boil the second. While cleaning up the first batch, chill the second. It makes for a busy afternoon but by spending an extra hour brewing, you have two batches of beer to show for your efforts instead of just one.

Should you try this "stagger-step brewing" process (no pun intended!), measure all your ingredients and schedule the brewhouse procedure the night before. The brew day will go much smoother if you do.



Boiling

6. Eliminate the dreaded boilover! It has happened to every brewer. But it does not have to keep happening. Have you ever noticed how boilover usually happens during the first few minutes of the boil? This is because proteins in the wort coagulate and form a sticky film as the wort

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comes to a boil. This film literally blows into a giant wort bubble once steam is released from the wort at the onset of the boil. There are two ways to help prevent this wort bubble from forming:

- Skim off the thick, creamy protein "head" that forms on top of the wort as it approaches boiling temperature.

- Throw a few hops into the wort before it comes to a boil.

7. Boil the wort for 10 minutes before adding the bittering hops.

Many proteins will coagulate and fall out of solution during the first 10 minutes of the boil. If you add hops before these proteins have a chance to coagulate, they will coat the hops and interfere with utilization.



Transferring to the Fermenter

There are several technical reasons you should achieve as clear a runoff as possible when transferring the wort from the boiler to the fermenter. It is

beyond the scope of this article to explain all the issues at stake here. Suffice to say that pouring wort through a funnel and screen into a fermenter is risky. Instead, either drain the wort through a drain valve at the bottom of the boiling vessel (the hops and trub form an effective filter bed) or siphon the wort off the top of the trub. If you choose to siphon, follow these steps:

8. With your brewing spoon, create a whirlpool in the brewing kettle. This will force the hops and trub into a cone at the bottom, leaving a "moat" of wort around the edges of the kettle.

9. The key to success when siphoning from the boiling pot is filtering out the hops and trub. Tie a copper-wound pot scrubber around the bottom of your pick-up tube to filter the hops and prevent them from clogging the siphon hose. The Chore-Boy brand pot scrubber is a good choice because it is made of pure copper. You can find them at most grocery stores with the cleaning supplies. Secure the pot scrubber to the bottom of the pick-up tube with a short piece of copper wire.

Suspend the bottom of the pick-up tube just above the trub layer at the bottom of the kettle. There are a couple of nifty siphon tube holders on the market now that make this an easy task. Halfway through the siphon, tip the boiling pot over a bit by placing a large book under the side opposite the pick-up tube. At the end of the siphon, all the wort will have run around the "moat" and will be sitting in a small

The secret (of siphoning) is to keep the outlet end of the siphon hose *above* the top level of the liquid from which you are siphoning when you start to pull the liquid.

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pool of wort at the bottom of the pick-up tube.

10. Aeration of the wort is essential before fermentation. One brewer active on the Internet came up with an ingenious idea for achieving this. You will need a 12-inch piece of 3/8-inch-diameter copper tubing, a drill, and a small (3/32-inch or so) drill bit. One inch from the end of the copper tubing, drill a hole straight through the tubing and out the other side. Turn the tubing

90 degrees and drill another set of holes. Sterilize the tubing and insert the drilled end into the outlet end of your siphon hose.

Start the siphon. As the wort goes by the holes you have drilled, it will suck (entrain) air into the wort. Prepare to shake down all the bubbles that form in the collected wort.

11. Siphoning is an essential brewing skill! Here is one technique:

The key piece of equipment is a

"siphon starter," a two-inch piece of 3/8-inch copper tubing. Insert the siphon starter into the outlet end of the siphon hose and put your mouth on it to start your siphon. Never, but never, place your mouth in direct contact with the siphon hose itself.

One reason people have problems siphoning is because they begin by keeping the outlet end of the hose below the top level of the liquid from which they are siphoning. Wrong! The secret is to keep the outlet end of the siphon hose *above* the top level of the liquid from which you are siphoning when you start to pull the liquid.

Stand up straight, with the siphon hose draping down from the pick-up tube back up to your mouth, forming a U-shaped loop. Suck on the "siphon starter"; the wort will travel down and up the siphon hose, stopping at a level equal to the top level of the wort in the kettle. (Practice this with water until you get it down.) Remove the copper tubing from the end of the siphon hose, replace it with the aeration tube described above, pinch the hose, and drop it into the fermenter.



Fermentation

12. Keep your fermentation temperatures stable. Stable temperatures are almost more important than maintaining proper temperatures—to a point. Do not allow the temperature of your beer to fluctuate more than five degrees per day.

13. Pure (liquid) yeast cultures are here, and they are wonderful. Use them if you can.

14. If you cannot use a pure yeast culture and need to use dried yeast, rehydrate the yeast. It is preferable to do two packs for 30 minutes in water that has been boiled and cooled to at least 80° F. (Grolsch bottles with flip-top lids, called cage caps, are great for this.) Do not pour dried yeast on top of the wort in the fermenter. The osmotic pressure on the yeast cells as they rehydrate is too great, causing many of them to burst. The result is a low yeast count.

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Kegging

15. Absolutely, positively replace all the rubber parts if you own a five-gallon Cornelius keg that has had cola or root beer in it. If you are not sure if it has held soda, replace the parts anyway!

16. Consider trimming one inch from the bottom of the pick-up tube in your keg to ensure clear beer from the first glass. You can always re-extend the tube by slipping a one inch piece of siphon hose over the end later.

17. Force-carbonate your beer at room temperature by placing it under 40 pounds of pressure or at 34° F at 13 psi for three days. Either method will give the same carbonation. Do not shake the carbon dioxide into the solution. Big "fish-eye" bubbles in your brew may be the result once the beer is poured into the glass. Let the CO₂ gradually dissolve into solution.

18. Here's another great gadget invented by a homebrewer: the \$3 counter pressure bottle filler!

Parts list: A 12-inch piece of 3/8-inch copper tubing. A one-holed stopper that fits your bottles. A standard dispensing tap (you know, the kind that came with your kegging set-up).

Stick the copper tubing through the one-holed stopper. Adjust it so the copper tubing just clears the bottom of the bottle as the stopper fits snugly into the mouth of the bottle. Jam the "mouth" of the tap onto the copper tubing sticking through the top of the bottle.

Fill each bottle with carbon dioxide from your keg, dispensed at around four pounds per square inch (psi). Fill them all at once. Since CO₂ is heavier than air, it will stay in the bottles.

Stick your \$3 counterpressure filler into the first bottle. Instead of pressing down on the "handle" of the tap to release beer into the bottle, flip the handle backwards. This locks it in the open position. Beer will then flow into the bottle until the pressure equalizes. Gently push the stopper back with your thumb, releasing some pressure, and the bottle will continue filling! Flip the handle back down and fill more bottles.



Clean-up

19. Quick-drain a carboy by sticking a semi-rigid tube (low-density polyethylene tubing or copper tubing) through the neck of the carboy into the "head" space at the bottom. The tube will vent air, allowing the water to rush out without gurgling.

20. If you still ferment in plastic buckets, it is important to store

them properly. Refill your fermenter to the brim with a dilute solution of bleach and water (one teaspoon of bleach per gallon). Let it "pickle" until your next brew day. Rinse with boiling water.

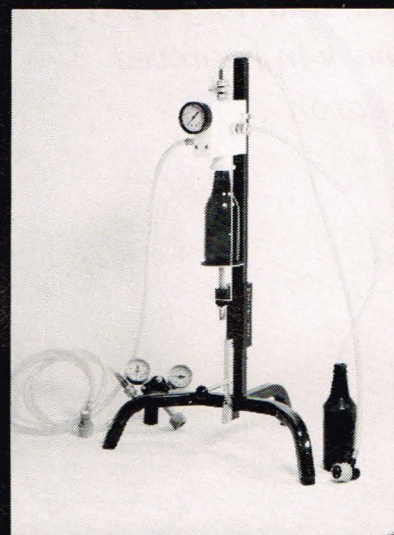
The poor reputation of plastic fermenters probably comes more from the way they are stored between brewing sessions than anything having to do with the plastic itself. 

Homebrewer Kinney Baughman brews professionally at Cottonwood Grille and Brewery, Boone, N.C.

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BREATHE SOME LIFE

Give yeast enough oxygen, and they'll pay you back in improved beer flavor.

By
Ashton Lewis

The captain's voice is crisp. "Flight attendants prepare for departure."

The plane turns onto the runway, taxis, builds speed, and lifts into the air. At first the passengers are active and talkative. But by the time the captain picks up the intercom again to announce "We have reached our cruising altitude of 32,000 feet," many have dropped off to sleep. A woman near the front is snoring. A man toward the back has his eyes closed, mouth open, and appears to be drooling.

It's a scene repeated on airline flights every day. But why? One likely possibility is an inability of air recirculation systems used on commercial airliners to provide ample oxygen to passengers' lungs. According to a recent *60 Minutes* report, the amount of oxygen in a pressurized airline cabin quickly falls to a concentration lower than that found in normal air due to this recirculation.

Where Did All the Oxygen Go?

This airplane story is very similar to the way many homebrewers treat their yeast. They pitch yeast into a low-oxygen environment and expect them to reproduce like a bunch of rabbits. But low-oxygen conditions lead to poor yeast growth, sluggish fermentations that may not completely finish, and the production of elevated concentrations of esters (fruity flavors).

The brewing process usually begins

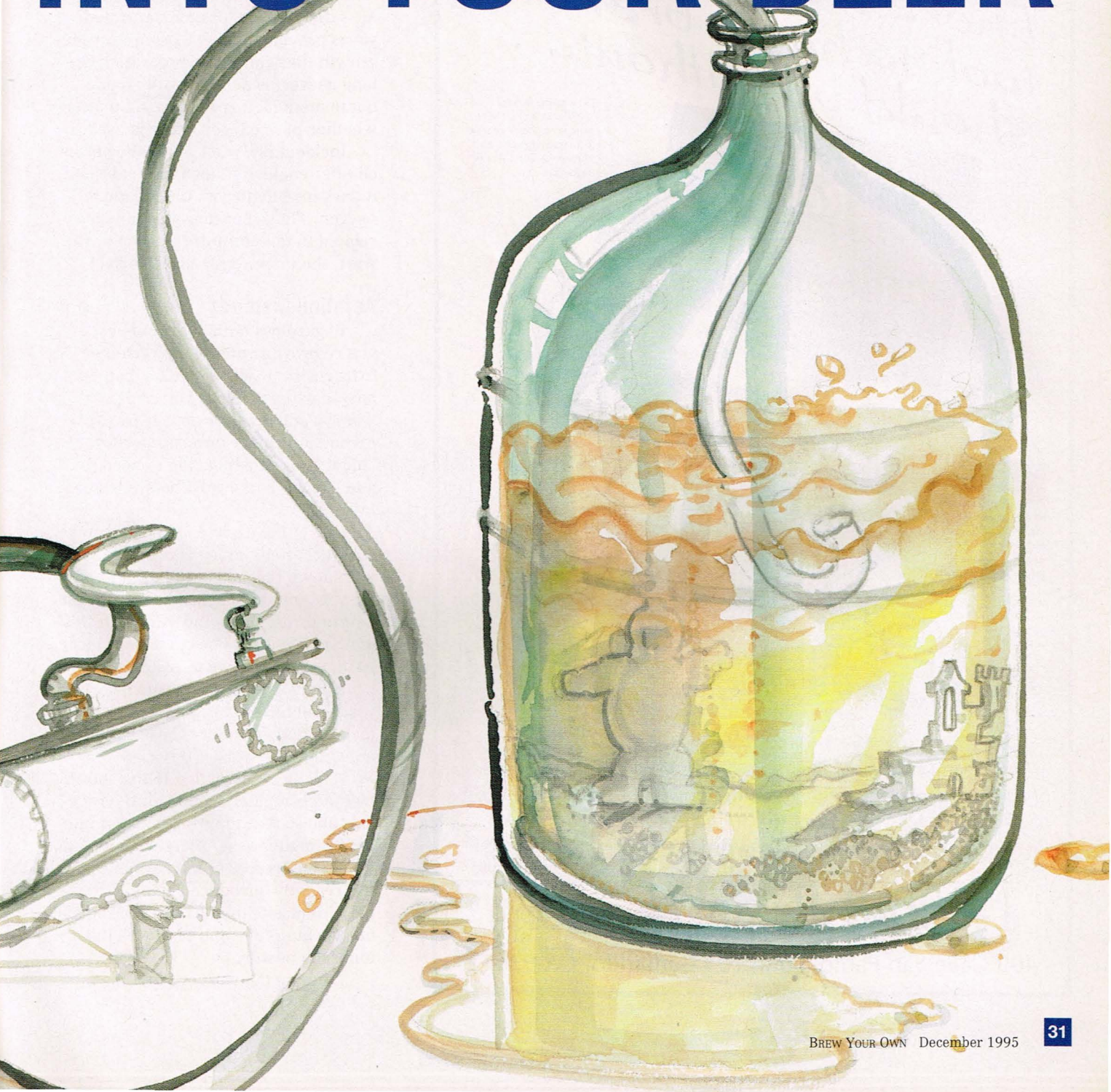
with cool water that is heated for use during mashing or for dissolving malt extracts. When water is cool, it contains a fair amount of oxygen, generally between 10 and 15 parts per million (ppm). This concentration is usually just right for yeast. However, during wort production the water is boiled (as wort) and almost all of the oxygen is stripped from it.

The solubility of oxygen decreases as temperature increases. If the wort is quickly cooled and transferred to a carboy fitted with an airlock or blow-off tube with its free end submerged in water, it will have a low oxygen concentration.

When yeast are added to wort, they begin to reproduce. Yeast require oxygen during their growth phase for the synthesis of healthy cell membranes. Because most of the yeast growth observed during fermentation occurs in the early stages, oxygen is only needed at the beginning of fermentation. If there is insufficient oxygen, cell growth will be stifled and the off-spring that are pro-



INTO YOUR BEER



duced may be weak. This leads to slow fermentations that may never completely finish. In addition off-flavor production is linked to low-oxygen worts.

Getting It Right

In addition to temperature, oxygen solubility also depends upon wort gravity and the presence of other gases, such as nitrogen, in solution. Most worts have the ability to hold

ample oxygen for yeast growth. In worts above 16° Plato or 1.064 specific gravity, oxygen solubility reaches a level that is a bit too low. That means beers produced from these worts tend to be fruitier, and the fermentations are often slower. The best way to deal with this fact of life is to increase the amount of yeast you use.

Other gases are often dissolved in the wort. If you use air to oxygenate wort, both nitrogen and oxygen are

being added. In a 12° Plato or 1.048 wort, the oxygen concentration is 8.5 ppm when the wort is saturated with air (both nitrogen and oxygen). This oxygen concentration is sufficient for healthy yeast growth provided that a proper yeast pitching rate is used.

Some brewers find it convenient to use bottled oxygen for aeration. Pure oxygen will provide four to five times more oxygen dissolved in the wort than the oxygen concentration when air is used. Nonetheless, data published in *Malting & Brewing Science*, a classic brewing reference, show both air-saturated and oxygen-saturated worts provide enough oxygen for yeast growth. Basically, this means that as long as wort is aerated with an adequate method, it really doesn't matter whether pure oxygen or air is used.

Incidentally, wort should be aerated after cooling. If hot wort is aerated, it darkens but doesn't absorb much oxygen. That's because solubility is related to temperature: the cooler the wort, the more oxygen is absorbed.

Aeration Methods

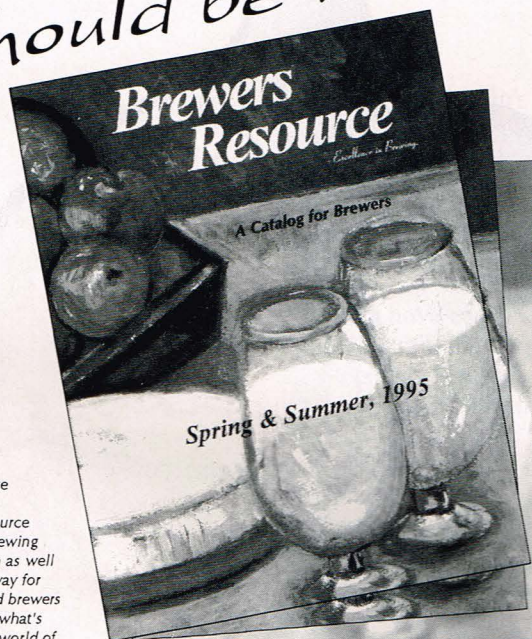
Regardless of the type of beer you're brewing or whether grain or extracts are used, wort after boiling has no oxygen. And if you cool your wort by adding tap water or use an immersion chiller or a counterflow chiller, you are still going to need to add oxygen to the wort before fermentation.

One of the easiest methods to aerate wort after cooling is to run the wort down the side of the primary fermenter or to let it splash around when pouring from the kettle. Although this method is easy, it doesn't always incorporate enough oxygen. Also, if you have high concentrations of airborne yeast and bacteria in your home, this method may introduce these contaminants into the wort.

A slight modification to the splash method is to alter the end of the racking tube so that the wort fans out into the fermenter as it enters. FermenTap, the manufacturer of the FermenCap, has recently introduced a snazzy little piece of plastic that attaches to the end of a racking tube and produces this umbrella of wort.

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BRING HOME THE GOLD

Simple Devices

tubing or a short piece of rigid racking cane that is the right diameter to fit into your flexible racking hose. Drill several small holes (1/32" to 1/16") over the last two or three inches of the short, rigid tubing. Connect the other end of the tubing to the flexible hose. As the wort passes by the holes in the tube, it sucks in air. This is basically like a wort carburetor. Although extremely effective, this method also

Avoiding Contamination

- A carboy.
- A rubber stopper that fits in the carboy.

- A long glass or plastic tube about three inches taller than the carboy.
- A three-inch segment of the same tube.
- A plastic T fitting with hose barb ends.

To construct the device begin by drilling two holes in the stopper that are large enough to push the plastic or glass tubes through. If you are using glass tubing, lubricate it with soap and keep your fingers holding the glass tubing close to the stopper as you carefully push the tubing in. This is a safety rule that prevents serious injury if you break the glass tube as you push it into the stopper.

The short tube should have about equal lengths above and below the top of the stopper. The long tube should come about 1/2 inch from the bottom of the carboy when fitted with the stopper.

Next, connect the T fitting to the long tube by inserting it over the tube or by using a short piece of flexible hose to make the connection. The T fitting should be oriented such that one end points down to the carboy, one end points straight up, and the third end is perpendicular to the first two.

The perpendicular barb is where your flexible racking hose carrying cool wort is connected.

You may find it necessary to trim off some of the plastic barb before making the final connection.

The last thing to do is to trim off the barb pointing up and stuff it with clean cotton sprayed with vodka right before use.

This system works by sucking air into the wort as the cool wort enters the T fitting. The air is drawn through the cotton, which filters out most airborne contaminants, and into the wort. The tube extending to the bottom of

34

the carboy minimizes splashing, which means that you get a clean fill that doesn't foam the wort. The short tube allows air from the carboy to escape as the wort fills the fermenter.

How They Work

Both of these carburetor methods look funny when first built. They look like devices meant to spray wort onto your floor instead of aerating wort. But they do work, and they don't spray it onto the floor.

The tube with several small holes in it works because the holes are small enough to inhibit leaking by capitalizing on the surface tension of wort.

The second method works because the open end points upward and the liquid enters the aerator from a lower point on the T as it travels to the bottom of the carboy. To quote one brewer, "Gravity never takes a day off." The wort is not about to jump out of the top of the T, even if the vessel it is coming from is higher than the open end. All bets are off if the tube filling the carboy gets

clogged. However, this is unlikely.

Airstones

Another method for aeration involves injecting air or oxygen through a sintered stone and into the wort. The air-injection system can be built with fish-bowl technology. You'll need:

- An aquarium aerator.
- An aerating stone.
- An in-line 0.2 to 0.5 micron membrane filter (the type that fits on the end of a syringe).
- Some tubing.

Basically, you want to pump air through the filter, to the stone, and into your cooled wort, which is already in the primary fermenter. This method is very simple, is effective, and removes airborne contaminants. Once you're set up and ready to go, it will cost \$30 to \$40. If you want to use this method but don't want to build the system, Brewers Resource sells it.

An alternative to this method is to use pure, bottled oxygen to force through the sintered stone. Since noth-

ing can live in pure oxygen, a sterile filter is not required. The Oxyner, which is distributed by Liquid Bread (Orlando, Fla.), provides all of the bits and pieces needed to use pure oxygen in a home brewery. If you love gadgets, these units can be modified so that the air or oxygen is injected in-line between the wort cooler and the fermenter.

The important thing is that you must aerate your wort. Pick a method that suits your needs and use it! In many parts of the country airborne contaminants are minimal. But if your area has a lot of pollen and especially dust, which carries bacteria and wild yeast, you should be careful.

Finally, all the oxygen in the world doesn't repair problems caused by underpitching. As long as you pitch enough good, clean yeast, properly aerate your wort, and ferment at proper temperatures, fermentations will finish in three to 10 days and flavor compounds will remain in the "normal" range.

Happy brewing!



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A LIGHTER

By John Naleskiewicz



SHADE OF PALE

Take advantage of a palette of resources to control the color of your brew.



TODD HAMMOND PHOTOS

Before taking your first sip, lift your glass and examine the color of the beer you are about to enjoy. Depending on the style, its color can range from a pale yellow to a rich amber, a delightful brown, all the way to the murkiest black. You come to expect certain types of beer to have a certain color. Who ever heard of a pale stout? The color of a beer doesn't contribute to the taste directly but comes as a side effect of the type and quantity of ingredients used and how

they were handled during brewing.

What makes a beer darker or lighter? The most common answer is that it depends on the malt that is used. If you use a dark-colored malt, you get a dark beer. Using a light-colored malt will get you a light-colored beer. Using a mixture of light and dark malts will let you create a beer with almost any color in between. That's the simple answer, but in reality there are several other factors that can affect the final color of the beer.

The primary ingredient in beer is water, which makes virtually no color contribution. The next most abundant ingredient is the malt. Malted barley gains color from being malted and then roasted. It comes in a variety of shades ranging from light yellow to the blackest black. The color of the malt used to brew a beer definitely impacts the beer's final color.

Hops can contribute slightly to a beer's color. Hops are usually greenish yellow but produce a light brown tea when boiled in a small quantity of water. The quantity of hops used in beer is very small compared to the quantity of malt used. Therefore, the malt provides the primary coloring factor in beer. The coloring effect of the hops is considered negligible.

This means that if you know the color of the malts used to make the beer, you are in the right ballpark to predict the color of the beer being made. The largest additional color contribution comes from Maillard reactions, also known as browning reactions.

If you have ever cooked anything, you may have noticed that foods tend to turn brown when you heat them. What you see is the result of complex reactions that occur between the sugars and the amino acids in the food when it is heated.

This same reaction happens to the sugars in your wort as you heat it. The longer and more strongly you heat the wort, the greater the impact of these browning reactions. These reactions are also what take place in the malt roasting process. The longer the malt is roasted, the darker its color will be.

Another factor affecting color is caramelization. This is the darkening of sugars as a result of exposure to high temperatures. Unlike the browning reactions, caramelization reactions don't involve amino acids.

Caramelization takes place when sugars are heated above 400° F. Whether you realize it or not, you have seen burnt sugar. In fact caramel coloring, which can get very dark, is the main coloring agent in most colas. Again, the degree of caramelization depends on the temperature and the length of time the sugars are heated.

Finally, oxidation will darken the color of beer. Oxidation is the chemical reaction that takes place when a chemical compound combines with oxygen.

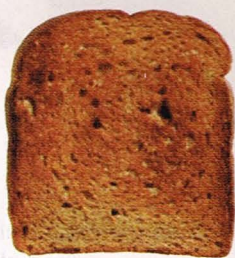
When wort, or even fermented beer, oxidizes it gets darker. Oxygen makes up about one-fifth of the air around us, so any time something is exposed to the air you have the potential for oxidation. All chemical reactions take place faster at higher temperatures. Therefore, hot wort is more susceptible to oxidation than cool wort. Oxidized wort tends to give the resulting beer undesirable flavors, so it's something you want to avoid. That's one of the reasons you don't splash the hot wort around if you can avoid it.

The Lovibond Scale

To measure beer color two things are needed: a standard way to characterize color and predefined units that can be easily reproduced.

This was the goal of J. W. Lovibond when he initially developed the beer color standard back in 1883. His system of measuring beer color was used for more than 60 years. Under his system the brewer compared his beer to either a standard set of bottles containing colored liquid or to a set of colored glass slides to determine the beer's color rating.

The bottles or slides were labeled to indicate the color rating of each in degrees Lovibond. These original color measuring methods were prone to inaccuracy because the liquid in a set of color standards would change due to aging and exposure to light and heat.



The Maillard reaction turns your bread—and your malt—brown.

However, since there was no accepted alternative, this method was used until the late 1940s and early 1950s, when more modern and consistently reproducible methods started being developed.

Specifically, the use of the spectrophotometer allowed a more accurate and consistent way to define the absorption of specific wavelengths of light by a liquid. The Standard Research Method (SRM) scale, currently used in the US for measuring beer color, was developed to closely match the original Lovibond scale. This same color scale is also used to determine the color of grains used for making beer. Colors determined by the Standard

Why Isn't Beer Blue?

Color is a relative thing.

Light and color are first cousins.

Visible light is radiated energy at very high frequencies. There are two ways to measure frequencies. They can be measured in cycles per second (also known as Hertz, Hz) or they can be measured by their wavelength. Light is most commonly described by its wavelength in nanometers (billionths of a meter).

The visible light spectrum ranges from approximately 400 to 700 nanometers. The longer wavelengths (lower end of the spectrum) appear red and orange, while the shorter wavelengths (upper end of the spectrum) appear blue and violet. Normal white light is made up of a relatively uniform mixture of all the wavelengths of the visible spectrum.

The way an object interacts with light determines how it appears to our eyes. For something to be seen, it has to reflect light. If light passes right through an object without being reflected, the object appears transparent (such as clear water or glass). For an object to have color, it needs to absorb certain wavelengths of light. You will see the colors that are not absorbed. Black objects absorb all the wavelengths of light, so you see no color (black is the absence of color).

Beer reflects mostly yellows and reds (the longer wavelengths), which means that it absorbs the blues and violets (the shorter wavelengths).

"Can it really be any good?" a young woman whispered. "Heavens no," Thomas exclaimed. "He's never brewed a drop in his life."



They Laughed When I Told Them I Was Serving My Own Home Brewed Beer, But When They Tasted My Pale Ale!—

Thomas brought a gift of his latest micro-brew discovery that he wanted everyone to try. I decided that this would be a dramatic moment for me to make my debut. To the amazement of all of my friends, I strode confidently over to my Alephenalia Micro Brewery-Home Brew Kit and began to pull out the professional looking bottles that I had placed there.

"Chuck is up to his old tricks," somebody chuckled. The crowd laughed. They were all certain that I couldn't brew any more than I could make potatoes au gratin.

"Can he really brew?" I heard Thomas' partner whisper. "Heavens, no!" Thomas exclaimed. "He's never brewed a drop in his life. But just you watch him. This is going to be good."

I decided to make the most of the situation. Holding up the wing capper, I explained that I had bottled it just for this occasion. With mock dignity, I drew out a bottle and cradled it in my arms like a great wine. "Is this another of those disappearing ink trips," called a voice from the rear. The crowd rocked with laughter.

Then I began to pour.

Instantly a tense silence fell on the guests. The laughter died on their lips as if by magic. I poured a glass for everyone, even those who exclaimed "I don't like beer." I heard a gasp of amazement. My friends sat breathless, spellbound.

I sampled it myself and for a brief moment I forgot the people around me. I forgot the hour, the place, my fellow imbibers. The little world I lived in

seemed to fade—seemed to grow dim—unreal. Only the ale was real. Only the ale and the visions it brought me. Visions as beautiful and as changing as an autumn sunset, with its amber hues, just like my homebrew.

A real Triumph!

As everyone finished tasting, the room resounded with accolades. I found myself surrounded by excited faces. How my friends carried on! Men shook my hand—wildly congratulating me—pounding me on the back in their enthusiasm! Everybody was exclaiming with delight, plying me with rapid questions. Chuck! Why didn't you tell us you could brew like that? Where did you learn? How long have you been brewing?

"I simply followed the complete instructions included with the Alephenalia Homebrew kit," I replied. "And just a short while ago, I didn't know hops from malt."

"Quit your kidding," laughed Thomas, a real beer enthusiast. "You've been brewing for years. I can tell."

"Only since Rosie gave me an Alephenalia Microbrewery for my birthday, less than three weeks ago. I decided to keep it a secret so that I could surprise all you folks." Then I told them the whole story. "Ever heard of Liberty Malt Supply Company?" A few of my friends nodded. "That's a home brew shop and mail order catalog!" One of the oldest in the entire country!

"Exactly," I replied. "They have a great program for learning how to brew beers like a professional, the Liberty Way."



THE LIBERTY MALT CATALOG

How I learned to brew without a teacher.

And then I explained how for years I had longed to brew my own beer. I shared that dream with Rosie and when she saw the Alephenalia Microbrewery in the Liberty catalog, she knew it was the perfect gift for me.

A Complete Catalog!

Pointing to the colorful Alephenalia Micro-brewery carton, I explained, "It contains brewing equipment that can be used over and over to brew beers like the professionals." I told them how pleased I was with Brewer's Companion, a real home brewers bible. The Liberty Pack included with the microbrewery contained enough pre-measured, concisely labeled ingredients to brew five gallons of the Pale Ale. I explained that each of the Liberty packs used the highest quality ingredients, exclusive to Liberty Malt and that packs for each of the classic brewing styles are available.

I proudly told them that I have already begun brewing Weekend Weiss, a Bavarian style wheat beer and Liberator Doppelbock, both promptly received by simply dialing Liberty Malt's own toll free number, 1-800-990-MALT (6258).

Favorite brewing styles

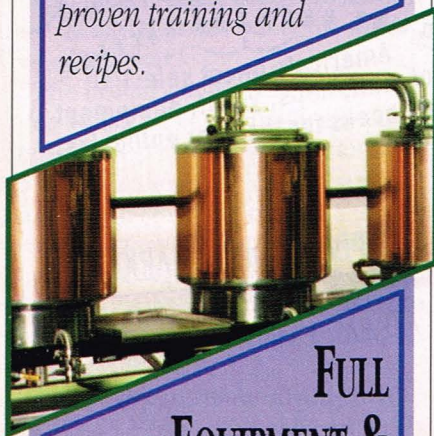
"Let's order Liberty's Pals Pils Pack!" Thomas pleaded after seeing the Liberty catalog. He took another sip and said, "Which weekend is that Weiss going to be ready?"

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Research Method are reported as SRM, degrees Lovibond, and ASBC (American Society of Brewing Chemists); all are synonymous.

Homebrew Color

This is all great if you happen to have a spectrophotometer handy. If, unfortunately, you misplaced yours, you will have to use a different method for determining the color of your homebrew. There are a couple of easy methods to gauge the color within one degree Lovibond. One of the most common is to use a color guide to compare your beer to a set of standard colors. This is available to homebrewers as the Davison Homebrew Color Guide. It consists of a set of mounted photographic color slides in a plastic holder. These color slides correspond to a range of beer colors from 3° Lovibond to 19° Lovibond.

Another technique is to compare your homebrewed beer to a commercial sample with a known color value. This method is very similar to the original method of Lovibond except that you have to obtain new beer samples every time you evaluate your beer's color. This is not all that bad, since you get to drink your color standards.

Because commercial breweries go to great lengths to ensure consistency between batches of their beer, using

commercial beers as standards works quite well. Colors for several nationally available brands are given in the Beer Colors table (below). Colors can darken with oxidation, so try to purchase fresh beer for your standards.

Once you have beers in hand, it's time to evaluate color. Perceived color depends on glass size, so use a set of identical glasses. A glass with a two- to three-inch diameter works well, because it is wide enough to demonstrate color differences but not so wide as to make everything appear very dark.

Pour your standard samples and your homebrew into your sample glasses and place the glasses next to one another on a table. The color of your beer will either match one of the standards or fall between two of them. Color can be reported as a single number if it matches one of the standards, the average between two of the standards, or a range (for example, a beer can be between 10° and 15° Lovibond).

Controlling Color

Now that you know how to measure the color of your beer, the next step is to be able to predict its color before brewing. As stated earlier, there are several factors that impact the color of beer, with the major factor being the color of the grains used. The color of the malt is determined by the length of time that

Beer Colors

Basic Color	Product	Louibond rating
Yellow	Budweiser	2°
	Molson Export Ale	4°
	Henry Weinhard Ale	5°
	Anchor Liberty	8°
Amber	Samuel Adams Lager	9°
	Bass Pale Ale	10°
	Coors Winterfest	13°
	Anchor Steam	14°
Brown	Michelob Classic Dark	17°
	Paulaner Salvator	21°
	Henry Weinhard Dark	23°
	Anchor Porter	58°
Black		

Malt Colors

Malt	Louibond rating
Pale	2°
Wheat	2.5°
Cara-Pils	12°
Crystal	30°-60°
Dark Crystal	60°-120°
Chocolate	400°
Black	500°

the barley is roasted after malting. The roasting of the malted barley does more than just darken it. It also changes the flavor of the malt. The darker malts tend to have a deeper, fuller flavor than lighter malts.

Using a mixture of different colored malts allows you to control the final color of the beer. This includes adding adjuncts and specialty malts to the wort. You can also impact the color by adding other color ingredients such as molasses or other dark sugars. Using the ingredient color information, you can predict the final color of your beer if you limit the effects of the browning reactions, caramelization, and oxidation.

Both malt grains and malt extracts have a Lovibond color rating associated with them. (See Malt Colors chart above for some typical ratings.) Each is available in a wide variety of colors. The impact of using a malt of a particular color on the finished beer is determined by two factors: the quantity of malt used and the volume of beer being made.

Just as in creating a set of standard colors, if you dilute a dark liquid with enough water you will get a light-colored liquid. The same is true when using malts for brewing. It is easy to predict the final color of the beer based on the Lovibond rating of the malts used to brew the beer. Final color is directly proportional to the color rating of the malts being used and the wort's original gravity. (See Calculating Color box at right).

Procedures used during the brewing process also affect the beer's color

through Maillard (browning) reactions, oxidation, and caramelization. Unfortunately, it's difficult for the homebrewer to measure them and even more difficult to predict their effect.

The browning reactions take place when the wort is being boiled. The degree to which they affect the color depends on the concentration of the wort, the pH of the wort, and the amount of time it is boiled. The reactions take place more quickly in highly concentrated wort and when wort pH is high. High wort pH occurs when water is high in carbonates.

Oxidation occurs rapidly when the hot wort is splashed during transfer from the boiling kettle or when the hot wort is stirred vigorously for long periods.

Caramelization is most noticeable when the wort is boiled for a very long time (more than one to two hours) over a flame heat source. This is because the temperature of the wort nearest the flame heat source can become high enough (over 400° F) to cause caramelization. Caramelization of the sugars in the wort may be desirable for some beer styles, but it is usually unwanted. Gentler and more even methods of heating will help avoid caramelizing the sugars.

There are different ways to achieve

the same color beer. For example to get five gallons of 4° Lovibond beer, you can use 7.5 pounds of 4° Lovibond malt, or you can use 7.125 pounds of 2° Lovibond malt and .375 pound of 42° Lovibond malt. The 42° Lovibond malt is very dark, but only a small quantity is used. Both of these beers will have about the same alcohol level, since they both use the same overall quantity of malt (7.5 pounds), and the resulting color will be the same. While the color may be the same, the flavor of the two beers will be different because the malts are very different.

Other factors that affect the flavor of two beers with the same color are the type and quantity of hops and the strain of yeast used, the minerals in the brewing water, and the fermentation temperature of the beer. All of these will impact the flavor of the beer to some lesser or greater extent.

There is a complex relationship between your beer's color and its flavor. You can see that the taste doesn't come from the color of the beer. The color of the beer is the result of how and what was used to make it. Does that mean you can make a light-colored stout? Probably not, but by blending the right combination of malts and hops you can make a light-colored beer that has an unexpected taste.

Calculating Color

Color calculations give only an approximation of beer color because wort gravity, boil time, wort pH, and other factors can affect beer color. To calculate the effect of specific grains on color, use this equation for normal-gravity wort (1.040 to 1.060):

$$\frac{[(\text{lbs of grain}) \times (\text{color rating})] + [(\text{lbs of grain}) \times (\text{color rating})]}{(\text{total lbs of grain})} = \text{Beer Color}$$

Multiply the number of pounds of grain or extract you're using by the color rating. Do that for each type of grain or extract, then add the totals together. Next, divide the whole thing by the total weight of grain or extract used. The result is the color rating you can expect for your finished brew.

For example if you are using four pounds of 2° Lovibond malt and two pounds of 8° Lovibond malt the calculation would look like this:

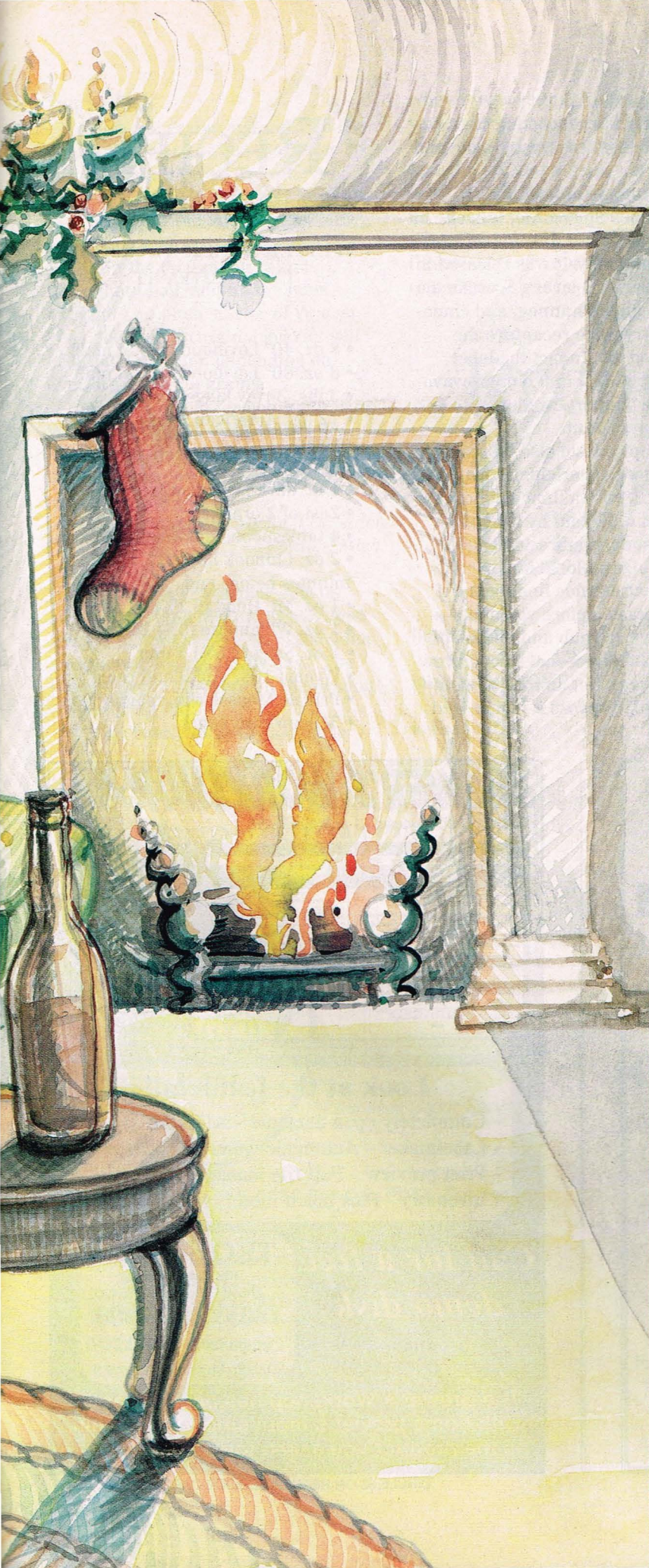
$$\frac{[4 \times 2] + [2 \times 8]}{6} = \text{Lovibond rating}$$

$$\frac{8 + 16}{6} = \text{Lovibond rating}$$

$$\frac{24}{6} = 4^\circ \text{ Lovibond}$$



K. Bybee



WINTER WARMERS



By S a l E m m a

Picture this. Frost creeps across your windows, spraying them white with crystalline paint. The wind makes every nook and cranny of your roof sing. Now and again a snowflake flies by the window, but you can't tell if it's falling from the sky or just blowing off the drifts that have buried your car.

The fire is blazing. The cat is curled up in front of it, content to stay there until at least the turn of the century. The ice on the telephone wires broke them from their moorings on the poles, taking the TV cable out, too. There's no phone and no TV.

Of course you don't have to go to work today. All you can think of to do is read that book you've been meaning to finish, wrap yourself in a comfy blanket, settle by the fire, and have...

...an ice cold beer.

Oooh. What's wrong with this picture? You say days like this are for hot toddy, single malt Scotch, cognac, or maybe Irish coffee? Well, you're right. But it's also a perfect day for a winter warmer, a high-alcohol beer meant to defrost your toes when the "weather outside is frightful."

So what's a winter warmer? The simple answer is, nobody knows. Only one rule applies: It should be higher in alcohol than "regular" beer.

"There is really no traditional type," says homebrewer-turned-entrepreneur Pete Slosberg of Pete's Brewing Co. "We tried working with the American Homebrewers Association to sponsor an award for winter beers, but there is no category. It's basically a time for brewers to have fun!"

Pete's answer to the style is his Wicked Winter Brew, which is in its third year of winter release. Pete says it's an amber ale flavored with raspberry and nutmeg. The first year it was released, it sold out in just a few

weeks. Last year they made more, so it stuck around through Christmas. You should be able to find it pretty easily this year, but act fast.

So what's all this about nutmeg and raspberry? In beer? There lies the second, informal aspect of the style: Many winter and holiday brews are flavored with things other than just hops, including spices and fruits.

The idea of spicing beer is actually older than hopping it. Historians say hops were first used around the ninth century. But they did not really become the worldwide standard for beer spice until the 16th century.

"I'm sure the idea of mulled ale—ale that is flavored with spices before it is consumed—goes back to the middle ages," says Bert Grant, chairman of the board and brewmaster of Grant's Yakima Brewing Co., Yakima, Wash. "Back then they did not have many distilled liquors to choose from. But strong wine, beer, and mead were common. My guess is they chose to create a celebration drink, mixing a little of each and giving it some spice

to make it special."

Grant says the concocting of this libation probably accompanied the end of the calendar year.

Grant's version of a winter warmer, Grant's Spiced Ale, was one of America's first spiced ales to be produced commercially. It was released in the early '80s. It's a strong Scottish ale spiced with ginger, nutmeg, and cinnamon. "I am trying to recapture the classic mulled ale. In fact the label suggests warming it in the microwave to hot-coffee temperature before drinking," says Grant.

Grant's Spiced Ale also fits the strong category. Its original gravity is around 1.072, with a final alcohol content of about 6 percent by weight.

All of a sudden a fireside beer sounds like a great idea! You should not have much trouble finding one if you want to taste before you make—almost every brewpub and dozens of micros release a seasonal strong brew this time of year. Get an idea of what flavors you like, choose a recipe, and dive right in.

RECIPE

WINTER WEYR WARMER (MASH-EXTRACT)

Ingredients

- 8 oz. 40° Lovibond crystal malt
- 8 oz. 80° Lovibond crystal malt
- 3 lbs. 2-row klages malt
- 12 lbs. American light dry malt extract
- 2 lbs. honey
- 1 lb. dark brown sugar
- Zest of 2 oranges
- 4 tablespoons unsweetened cocoa
- 2 oz. Chinook hops (11.4%) 60 minutes before end
- 1 oz. Mt. Hood (5.1%) 30 min.
- 1 oz. Willamette (5%) 20 min.
- 2 oz. Saaz (2.6%) 5 min.
- Wyeast 1087 Ale Blend yeast
- Prix de Mousse champagne yeast
- 3/4 cup corn sugar

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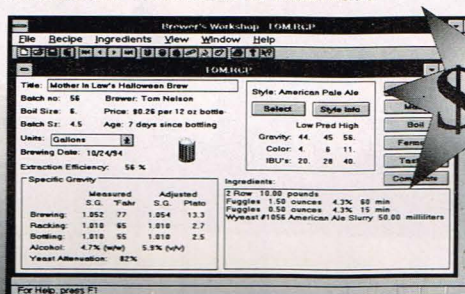
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CIRCLE 33 ON READER SERVICE CARD

Step by Step

Crush the grains and mash in five quarts water at 154° to 156° F for 30 minutes. Sparge with five quarts of water at 170° F. Bring water level up to five gallons and add extract, honey, brown sugar, orange zest, and cocoa. Maintain the five-gallon volume throughout boil, adding the hops.

Chill and pitch starter of Wyeast 1087 Ale Blend. Original gravity will be 1.080 or higher, depending on extract yield from grains.

After a week of fermentation with Wyeast, add one packet of Prix de Mousse champagne yeast (rehydrated) to finish fermentation. Bottle with corn sugar to prime.

*contributed by Michael Daleiden
Canton, Mich.*

"Winter Weyr Warmer gets its name from Anne McCaffrey's *Dragon Writers of Pern* series," says Daleiden, a computer consultant by day. "The Weyr is the cave where all the dragon writers hang out."

"This beer was really alcoholic

when it was young. All the spices were very assertive, each could be identified individually. I lost a few bottles and tasted it six months after brewing. It was quite different. The harshness of the alcohol was completely smoothed over. The spices had blended into one flavor—sort of a spiced hot chocolate undertone," he says.

RECIPE

YELLOW CAT DERBY CITY AUTUMN ALE (EXTRACT WITH SPECIALTY GRAIN STEEP)

Ingredients

- 3 lbs. plus 1/3 cup amber dry malt extract (DME)
- 1 box (3.3 pounds) Yellow Dog amber extract

- 3/4 cup crystal malt
- 1/4 cup black patent malt
- 1/2 cup chocolate malt
- 1/2 cup dark, unsulfured molasses
- 1/2 cup dark brown sugar
- 8 pieces star anise
- 2 oz. Fuggles hop pellets
- 1 oz. Kent Goldings pellets
- 1 tsp. Irish moss
- Yeast Lab British Ale Yeast (A04)
- 1 cup loosely packed fresh mint
- 3/4 cup corn sugar

Step by Step

Make starter 24 hours in advance, pitching A04 to 1/3 cup amber DME boiled in two cups water.

Dissolve DME in five gallons of cold water. Steep crystal, black patent, and chocolate grains (in grain bags) in this wort while bringing up to heat. Hold at 170° F for 15 minutes, then remove grain bags and bring liquid to a boil.

Turn off heat and stir in extract syrup, molasses, and brown sugar,

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CIRCLE 1 ON READER SERVICE CARD

making sure they're completely dissolved before restarting heat and resuming the boil.

Add the star anise and 1 1/4 oz. Fuggles. Boil 15 minutes, then add Irish moss. Boil 30 minutes, then add the remaining 3/4 oz. Fuggles. Boil 15 more minutes, turn off heat, and add Kent Goldings.

Cool, then rack to primary. Top off water to five-gallon level and pitch the active yeast starter. Rack to secondary after three days. Bottle or keg when fermentation ends.

At bottling time make a mint "tea" by placing one cup of loosely packed fresh mint leaves in two cups of water. Bring to a boil, then turn off heat and let the mint steep for five minutes. Discard the mint leaves, and boil 3/4 cup corn sugar in the mint "infusion" for two minutes.

"This makes a pretty tasty hot drink, but don't slurp it; use it for priming," says Garr.

Original Gravity: 1.055

*contributed by Robin Garr
Louisville, Ky.*

"This is basically an American brown ale with specialty flavors added," says Garr. "It came out really clean, with typical brown ale flavor and added complexity from the anise and mint. What's funny is the flavor was not readily identifiable as either anise-licorice or mint. It was just, well, exotic."

Drink this one earlier on. Garr says he lost a few bottles for six months. "By then it was still a good brown ale, but the exotic flavor had almost completely disappeared.

About that title: All Garr's homebrews bear the "Yellow Cat" label. "Yellow Cat is my good buddy Pumpkin, a 16-pound, 13-year-old feline with a tattoo on his upper arm who totes a chain saw. Louisville, my hometown, is the Derby City," he says.

Garr has been making his own beer since 1988. He has published several articles over the years, including a few on beer. He is Sysop (system operator) of CompuServe's Beer Forum Special Interest Group.

RECIPE

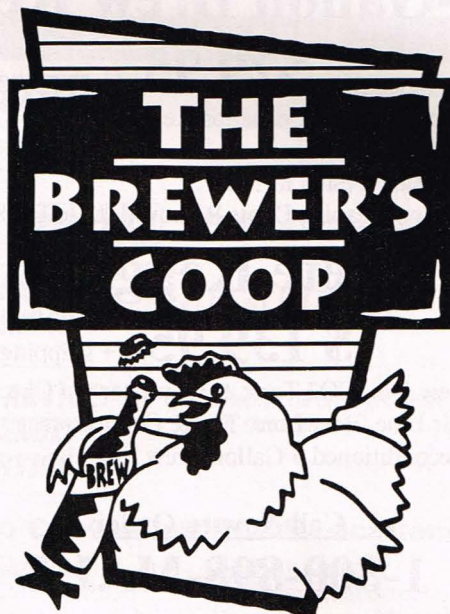
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Ingredients:

- 5 lbs. US 2-row malt
- 4 lbs. Dewulf/Cosyn malted wheat
- 1.5 lbs. whole wheat flour
- 1 lb. raw honey
- 2 oz. Saaz hops (2.1%) 60 min.
- 1 oz. bitter orange quarters (half added at 10 min. before end, half steeped in priming syrup)
- 1 oz. coriander (half at 15 min. before end, half at 5 min.)
- 3/4 cup corn sugar (priming)
- Brewer's Resource Belgian wit yeast
- 12 ml 88% lactic acid

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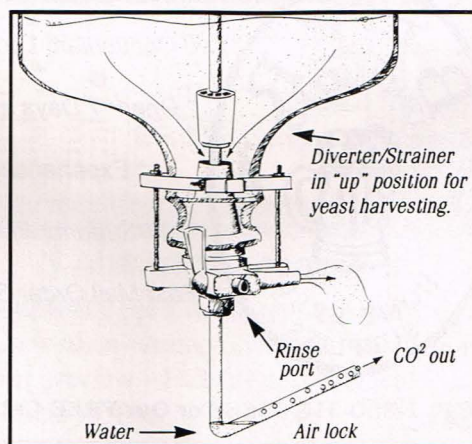
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CIRCLE 23 ON READER SERVICE CARD

Step by Step

For the mash, dough in to water at room temperature. To prevent clumping use a sifter to add the whole wheat flour to mash. Hold for 20 to 30 minutes, stirring occasionally to ensure complete hydration of grains and flour.

Bring mash to 130° F and hold for 30 minutes for a protein rest. Decoct 40 percent, boil 30 minutes. Replace decocted mash and add heat if necessary to raise temperature to 150° F. Hold for 20 minutes. Heat to 158° F and hold until conversion is complete (iodine test negative). Increase mash temperature to 170° F for mash out.

Sparge slowly with 180° F water. For the boil, top off the pot to 5.5 gallons and add all the hops at boil.

Add the honey and half the coriander at 15 minutes before end. Add half the bitter orange quarters at 10 minutes before end. Add the other half coriander at five minutes before end.

Chill and pitch. Ferment fully.

When bottling, pull off one quart of fermented wort. Add priming sugar

and boil 10 minutes. Add the other half of bitter orange quarters. Boil five minutes more. Cover the pot and let cool for 30 to 60 minutes. Add mixture to the wort, along with 12 ml lactic acid. Stir and bottle.

5.5 gal recipe

Original Gravity: 1.050

Final Gravity: 1.002

*contributed by Steve Tuttle
Atlanta, Ga*

Tuttle says Pierre Rajotte's *Belgian Ale* book inspired the recipe, as well as advice from other homebrewers. "I am a bit of a style fiend and try to research all beers I am brewing to get as close to the real McCoy as I can. I was able to locate true curacao bitter orange quarters instead of using regular orange peel because I found a source on the CompuServe beer forum. I wasn't able to find a source for whole wheat, however, so I used wheat flour as Pierre suggests in his book," he recalls.

Tuttle says the fun part of figuring out a particular style is the research. "I did a lot of tasting, trying Celis

White, Hoegaarden Wit, Riva Dentergems, and Blanche de Bruges. It was interesting to see the range of flavors and textures within the wit style."

Wit Christmas improves with age, he adds. "Initially I was disappointed because I wasn't able to taste the spices, but after about three months in the bottle, bam! They all kicked in and I thought it was a wonderful beer. The color was a little dark for the style. And personally I would like to bring the tartness up a bit, perhaps actually doing a sour mash next time. Bringing the coriander up a notch or two wouldn't hurt, either. I am a big fan of the delightful burst of coriander you get in Blanche de Bruges."

Brew Now for Next Christmas

When it comes to mead (fermented honey), the conventional wisdom is: Don't rush it. Here's an easy first mead recipe that will get you in the mead game with plenty of time until next winter, when it will really be something to write home about!

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RECIPE

MARGARET'S MEAD

Ingredients:

- 13 lbs. farm stand honey (Don't use the cheap stuff from supermarkets)
- 2 tsp. yeast nutrient
- Juice of four oranges

- Lalvin dry champagne yeast
- 1/3 cup honey
- Celestial Seasonings Harvest Spice Blend herb tea

Step by Step

Heat water in your brew kettle. Add honey when the water gets warm and stir to dissolve. Add orange juice. Bring the heat to around 170° F and hold for 30 minutes. The idea is to pasteurize the liquid, killing most of the

honey's wild yeast and molds, without boiling it. Boiling honey will damage its delicate floral aroma and character.

Add enough water to make five gallons. Add yeast nutrient and transfer to primary fermenter (glass or plastic). Rehydrate dry yeast in pre-boiled, cooled water, and pitch when wort is 80° F or below. For a dry mead use champagne yeast. If you want a sweeter mead, use mead yeast or ale yeast.

Since mead should be aged a long time, you will eventually want to get it into a glass carboy to prevent oxidation. I racked mine to glass after about two weeks. It stayed in glass until bottling time, almost four months later. You should plan your mead calendar with at least six months between brewing and drinking. A year is even better.

Prime with honey boiled in a cup of water. Some mead experts say it is better to prime with honey than corn sugar to avoid over-active conditioning and exploding bottles.

Add the flavoring to the mead before you bottle. You can flavor half the batch and leave half plain if you want. To use the tea boil about three cups water. Remove from heat and add six to eight bags Harvest Spice tea for half a batch or 12 to 16 bags for the whole batch. Steep for five minutes. Remove bags and add tea to the mead.

Some spice-shy tasters will like the plain version better, but my wife says that the spiced one "tastes like Christmas." Its alcohol warmth is immediately apparent. Mead is very deceiving. The aroma is so floral and sweet that it tricks your brain into thinking it's sweet at first sip. But in reality this mead is very dry because of the champagne yeast. It finishes dry, and each subsequent sip is more dry than the last.

The spiced version needs to be aged. Two weeks after bottling it was pretty awful. Four months after bottling, it mellows considerably and spices don't overpower the honey. It's quite tasty. Also, something in the spice blend reduced the effectiveness of bottle priming. The spiced bottles are just lightly carbonated.

Mead is such an unusual drink, ribbon-wrapped bottles make really special holiday gifts.

*contributed by Sal Emma
Cape May, N.J.*

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CIRCLE 41 ON READER SERVICE CARD

12 Great Holiday Gifts for the Brewer in Your Life (Maybe You!)

By David Weisberg

Avid homebrewer David Weisberg is the author of 50 Great Homebrewing Tips (Lampman Publications), now in its third edition. He insists that he has been very good this year, honest, and he knows exactly what he wants for the holidays.

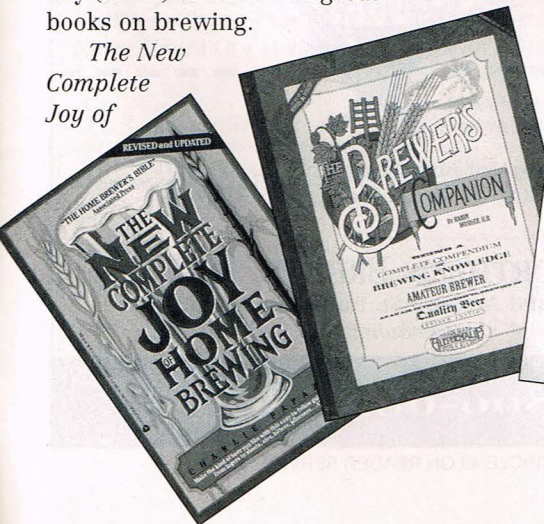
Whether they've been naughty or nice, all homebrewers deserve the right brewing equipment. If you're shopping for a special homebrewer in your life, take notes. Even if that special homebrewer is you! Here is my list of holiday wishes. (Are you listening, Santa?)

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1. Read. Learn. Brew. Drink.

If it's going to be a long, cold winter where you live, you may need some inside activities (besides brewing). Reading about your favorite hobby is the way to go. You can't go wrong with any (or all) of these five great books on brewing.

The New Complete Joy of



Homebrewing (Papazian, Avon Books). A classic every homebrewer should have within easy reach at brew time.

Brewer's Companion (Mosher, Alephenalia Publications). A source book for the small-scale brewer.

Brewing Quality Beers (Burch, Joby Books). A great primer on brewing; covers hopping very effectively.

Homebrew Favorites (Lutzen and Stevens, Storey Communications). A good source of recipes submitted

by homebrewers and professional brewers.

Brewing Beers Like Those You Buy (Line, G.W. Kent). A basic book for those starting out. Contains many recipes for brewing world-class beers and styles.

2. Simple Temperature

Control. When pitching yeast it's important to make sure the wort temperature is low enough to keep the yeast healthy, happy, and doing their job. Temperature is also important during fermentation. But how do you track it easily, without the worry of contaminating the wort by constantly opening the fermenter and dipping in a thermometer? The Fermometer to the rescue.



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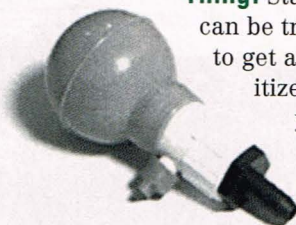


Turn one-, two-, or three-liter soda bottles into mini-kegs that you can store in your fridge. The Keg-A-Liter system by GLBS allows you to take your brew to

parties or keep several liters around in your kitchen refrigerator.

The Tap-Cap and the Keg-a-Liter system are manufactured by Great Lakes Brew Supply, Endicott, N.Y., (607) 785-4233. They are available at your local brew shop.

4. Even better than The Swamp Thing!



Starting a siphon can be tricky. You want to get a clean (and sanitized) siphon of your wort or beer going quickly and easily. Often the siphon

doesn't catch the first time. You may end up trying again and again. And if you don't pay attention during racking, you might lose the siphon and have to start it again!

Here comes The Sucking Thing. This simple device enables you to easily start a clean siphon. Just attach it to your siphon hose, and give it a few

squeezes.

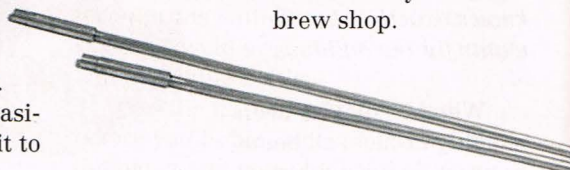
The Sucking Thing is manufactured by Lowenbitter Brewing Supplies, Danville, Calif. 1-800-474-7737.

5. Bottling made easier.

The next time you have to bottle a batch, don't do it without a special bottle filler. Sure, you can do it with a siphon hose, either pinched or clamped between bottles (to stop the flow). But undoubtedly you will experience sticky-beer-floor syndrome the morning after!

With Phil's Philler attached to your siphon hose (or bottling bucket spigot) you are sure to get it done quickly and easily, right to the perfect level each time. Phil's Philler is manufactured by Listermann Manufacturing, Norwood, Ohio. It is available at your local

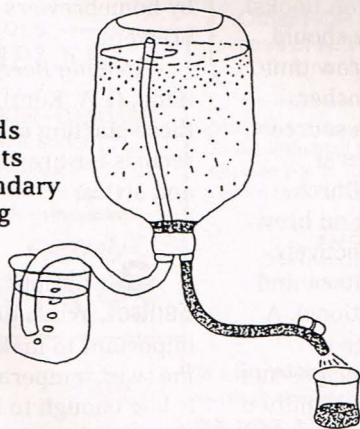
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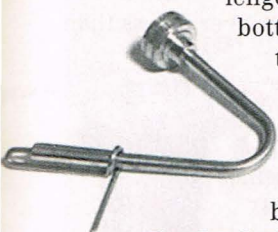
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6. Keep it clean.

When you have finished drinking a beer or brewing a batch, the challenge is to clean out the bottle or carboy to get the yeast cake off the bottom.



An easy way is to blast a jet of water into the bottle or carboy.

The Jet Carboy and Bottle Washer is one device that can save you time when you need to clean things up.

The washer is manufactured by Carboy and Bottle Washer Co., Traverse City, Mich., (616) 935-4555.

Note: You can attach the washer directly to your laundry tub faucet (garden hose type) or to your kitchen faucet by using an adapter and washer. My friend Bill uses a garden Y attachment on his basement brewery sink and leaves it on permanently. On one side he has a bottle washer attached, on the other there is access to water for filling and washing.

BETWEEN \$20 AND \$100:

7. Twelve reusable bottles.

You could scrounge around at recycling centers for brown, flip-top bottles—if you can find them. But if you want clean, new bottles in



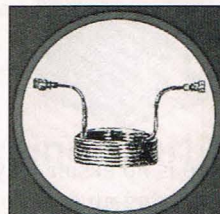
various sizes, consider ordering some of these babies.

One-half liter and one-liter reusable, flip-top, brown bottles are available from Bavaria South Inc., Manteo, N.C., 1-800-896-5403.

8. Quick chillin' for that hot wort in your life. What better way to quickly cool wort down to yeast-pitching temperature than with a shiny new copper-coiled beauty.

An immersion wort chiller is easy to use.

You can sanitize it by just plopping it into the brewpot 10 to 15 minutes prior to the end of the boil. Then hook it up to your kitchen (or basement) sink and the cold water running through the wort chiller will lower the wort's temperature to the right level in less than 30 minutes. Many companies make wort chillers—check your local homebrew shop.



The Home Brewery makes a nice wort chiller. Call 1-800-321-2739 for details.

The BrewChiller, manufactured BrewCo., Boone, N.C., is another good one. Call (704) 297-SUDS.

9. Aerate for a healthy fermentation. Here's a great gift for an avid brewer. The time between yeast pitching and the start of fermentation (lag

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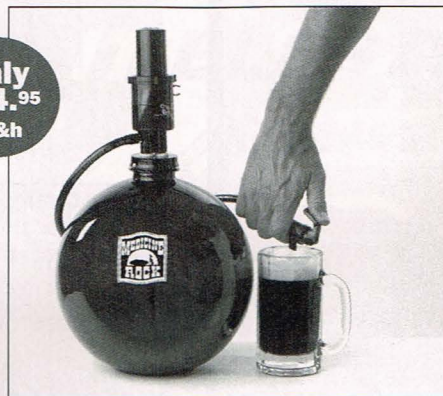
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there is no easier way to add oxygen than using an aeration device. The Oxynater is a nifty one.

You just lower the aeration stone (with the oxygen line attached) into your wort and turn on the oxygen supply for the desired time. Quick. Simple. Easy.

The Oxynater is manufactured by Liquid Bread Inc., Orlando, Fla., (407) 888-3533.



time) should be as short as possible. For healthy fermentations

have a spare fridge know the glory of brewing a delicious light lager during a

heat wave. Of course the more control we brewers have over the temperature, the better our beers will be.

The Brewtek is one of several thermostats available to help us with this endeavor. Just plug your fridge into the control unit, run the temperature sensor into the fridge, and set the temperature accordingly.

Brewtek Ferm Temp Thermostat is manufactured by Brewers Resource, Camarillo, Calif., 1-800-827-3983. Controls both warm and cool devices.



(and a couple of times learning) you can soon be filtering like an expert.

The Filtration Kit is a good example of the several filters that are available. It can filter your beer in less than an hour.

The Filtration Kit is manufactured by The Filter Store Plus, Rush, N.Y., 1-800-828-1494.



OVER \$100

12. And for that "I-just-won-the-state-lottery" category. Two- and three-vessel stainless-steel brewing systems have everything you need to brew 10-, 15-, or 20-gallon all-grain batches. If you have a need for a pilot brewery, then this is for you. It makes a lot of sense for some

homebrew clubs to consider investing in a system like this. What better way to learn about all-grain brewing and to increase your brewing skills than brewing a lot of beer on high-quality equipment?



Femto-Brewing System, manufactured by Pico Brewing Systems Inc., Ypsilanti, Mich., (313) 482-8565, retails for \$475 plus shipping.

Three Kettle All-Grain Brewing System, manufactured by Schumacher & Assoc., (517) 652-6535, retails for \$1,250, plus shipping.

Gravity Feed Brewing Systems, manufactured by Brewers Warehouse, Seattle, Wash., (206) 527-5047, retails for \$1,500, plus shipping.

Brew Magic is manufactured by SABCO Industries, Toledo, Ohio, (419) 531-5347. Call your local retailer for pricing.

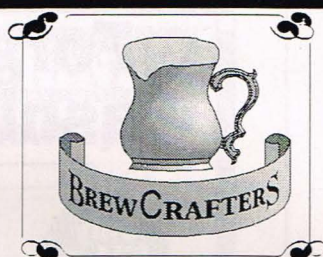
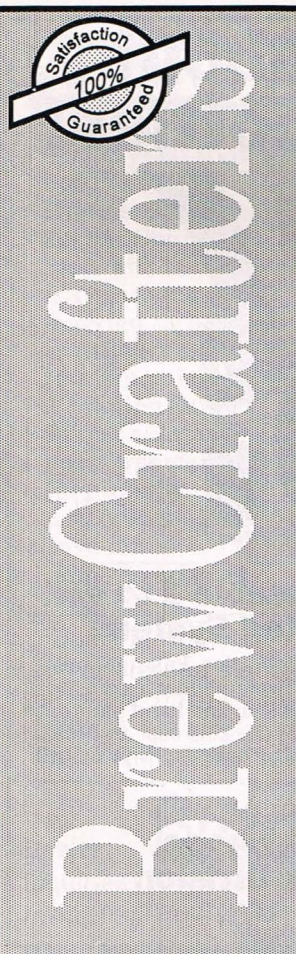
As I settle down for my long winter's nap...visions of homebrew keep dancing in my head. Merry Christmas, Happy Hanukkah and to all, a good brewnight!

10. Advanced temperature control.

Those homebrewers who

11. Filtering for success.

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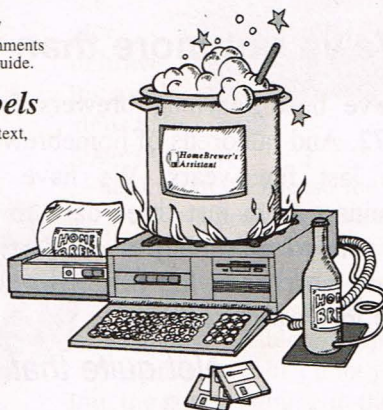
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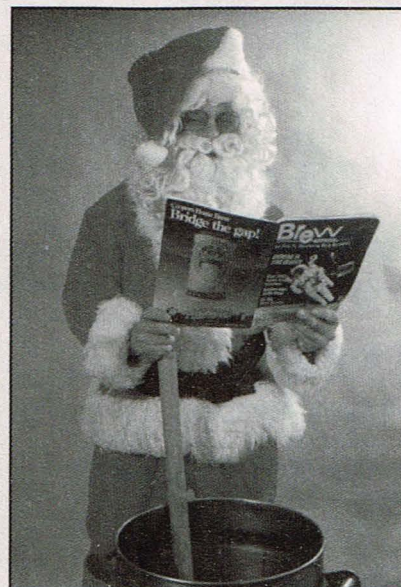


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Pros Who Brew With Extract

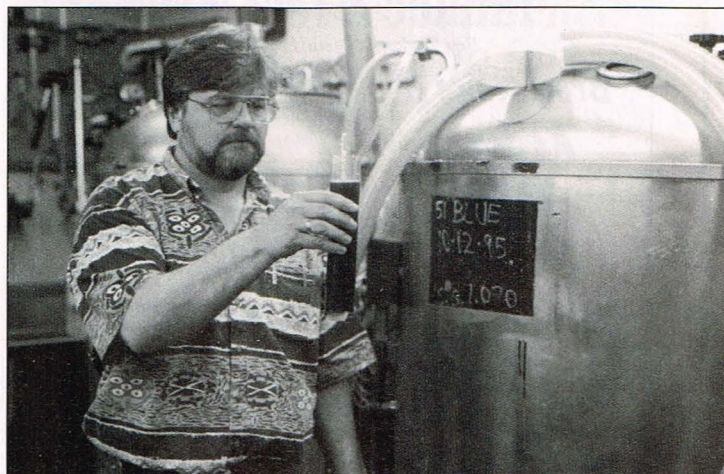
by Nico Freccia

Every beer made at Pacific Coast Brewing Co. is brewed from malt extract—including nine that won medals at the Great American Beer Festival.

Brewing with extract has never been easier, better, or more popular. As homebrewers, each one of us began brewing with that trusty can of thick, gooey malt extract. We were surprised that first time to discover that we actually made something that resembled beer. Even as we become more advanced in brewing procedures, we keep returning to that can to find over and over that it just plain makes good beer.



Pacific Coast Brewing Co. in Oakland, Calif., has been brewing award-winning extract beers for seven years.



Brewer Don Gortemiller checks the specific gravity of a fermenting batch of beer.

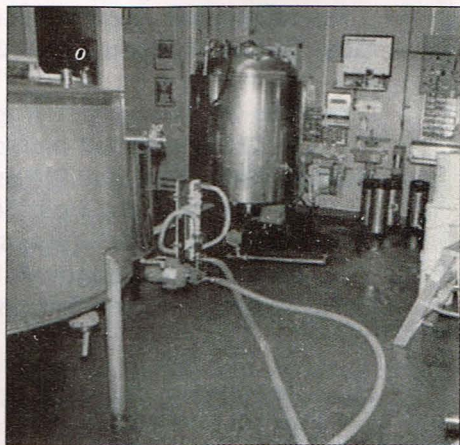
The truth is, 10 years ago there weren't many extracts available on the market, and there wasn't much information about the products that could be found. Now, as the micro-brewing industry continues to grow at a phenomenal pace and new homebrewers

daily take up the brewing charge, malt extract is becoming a bigger part of the brewing scene than ever before. There are several reasons that, with so much more information readily available about brewing science, equipment, and procedures, homebrewers and microbrewers alike continue to return to extract.

As any industry grows and begins

to develop a market, manufacturers and retailers see sales opportunities and compete to make and sell better-quality products. In 1995 canned malt extracts often provide much more information on their labels including ingredients (and adjuncts or syrups if any), color, and gravity than ever before.

Unlike in the frontier days of homebrewing, extracts are now made from high-quality malting barley by companies that brew and package their extracts specifically for the brewing industry. Not too long ago



Pacific Coast's brewing area. The brew kettle (rear), heat exchanger (foreground, center), and whirlpool (left).

Don Gortemiller of Pacific Coast Brewing Co. and Tom Alexander of California Concentrate Co., makers of Alexander's Sun Country Malt Extract, offer these tips for better brewing with extract.

1. Use the palest extract you can find.

By using an ultra-pale extract, you will have the final say on the flavor of the beer you are making. That's where specialty grains come in. Many malt extracts have a characteristic flavor that will show up no matter what the original formula might have been.

2. Try using the extract by itself.

Brew with your extract of choice without specialty grains first. Get to know what it tastes like.

3. Read labels!

Quality of ingredients and batch-to-batch consistency are the most important factors to consider when buying extracts. Some extract makers use adjuncts, maltose syrups, and additives. Talk to your retailer and read the labels on cans and drums. Also, be sure the extract is made specifically for the brewing industry.

4. Buy only what you need.

Malt extract is a perishable food

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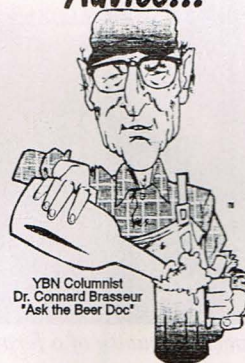
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Dear Dr. Brasseur,
My dog Swifty won't drink any of my homebrew. Any suggestions?
R. Flanagan, Essex, Vermont

Yeah, get a new dog

Dear Dr. Brasseur,
Please settle a bet. My buddy is a high school French teacher. According to him, your name means "jerk brewer" in French. I think it means "grouchy old bastard" or something like that. We've got ten bucks riding on this one.
J. Fitzpatrick, Boston, MA

Dear J. Fitzpatrick,
Guess what your name means in Gaelic? It just so happens that my father (who is known to me) had a good French Canadian sense of humor. Pay your nitwit friend that saw buck and leave me out of it.
Dr. C.B.

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to Better Extract Brewing

product and is not stable for home storage outside of the can. Individual extract cans are pasteurized and should keep for a long time at cellar temperature or under refrigeration.

If you buy extract in pre-packed plastic containers or straight from the drum in your own container, buy only what you need to brew immediately. Though the high gravity of extract is initially inhibiting to wild yeast, mold, and bacteria, extract is an ideal growth medium. Nasties will quickly gain a foothold and sour your extract. Storing extract bought from bulk drums in the fridge will greatly extend the extract's shelf life.

5. Confirm your retailer's storage practices.

As mentioned above, individually

canned extracts are pasteurized, but 55-gallon drums are not. Drums should be dispensed in the shop under CO₂ or nitrogen to inhibit airborne bacteria and yeasts from spoiling the extract. Ideally, drums should have a two- to three-week turnover rate in the homebrew shop, and they should not be kept for longer than 60 days. Many shops have a much faster turnover rate, so their product will always be fresh. Ask them!

6. Get to know the extract gravity.

A few degrees difference in extracts will create a noticeable change in solubility, color, and flavor of your beer.

7. Do a full wort boil for consistency.

Boiling a small, concentrated volume of wort will increase production of melanoidins—organic compounds affecting beer color—and hop extraction will be more difficult. If you have to do a concentrated boil, do it at the same volume every time to maintain consistency.

8. Always follow sound brewing techniques.

- Whirlpool your wort to coagulate and settle proteins.
- Use a wort chiller.
- Aerate your wort thoroughly.
- Always clean first, then sanitize!

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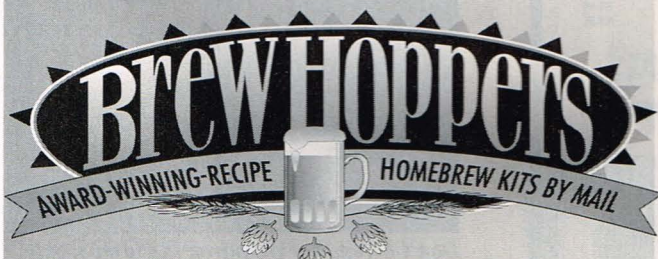


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this wasn't necessarily the case. Often, malt extracts sold to the homebrewer were cast-offs from the food industry and were of highly variable quality.

The burgeoning interest in homebrewing aided the rise of countless new homebrew supply shops. Their owners are avid and knowledgeable brewers. They make it their business to know the products they carry and the proper ways to store

and dispense them. And they regularly insist on and update information from their suppliers.

Finally, brewing with extract allows the brewer at any level of expertise to experiment quickly, easily, and safely with styles, yeasts, or any combination of raw materials.

Extract continues to hold a place in the commercial brewing world as well. With the high demand currently placed on the microbrewing industry,

it isn't always possible for the brewpub or microbrewery to mash the quantity of grain needed to supply beer to its patrons. Some small breweries solve this problem by using a small amount of high-gravity extract to stretch their all-grain wort and still meet the quality standards their customers expect. In some cases breweries use nothing but extract, and the resultant beers might surprise you.

The Pacific Coast Brewing Co., in Oakland, Calif., opened its doors for business in October 1988 serving three standard brews and four to six rotating specialty beers. In 1989 the brewpub won a silver medal in the Scottish Ale category at the Great American Beer Festival (GABF). In 1990 it won two GABF medals. Pacific Coast won again in 1991, '92, '93, and '94. During the first half of 1995, their beers won three medals in local competitions. In October Pacific Coast brews took two more at the GABF. Columbus India Pale Ale won a silver in the IPA category and their Belgian Triple won the gold medal for Belgian-style ales.

In the seven years they have been open, every single beer brewed at Pacific Coast has been an extract beer. Several of their standard brews are even offered as extract kits to homebrewers through HopTech, a



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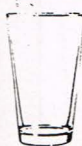
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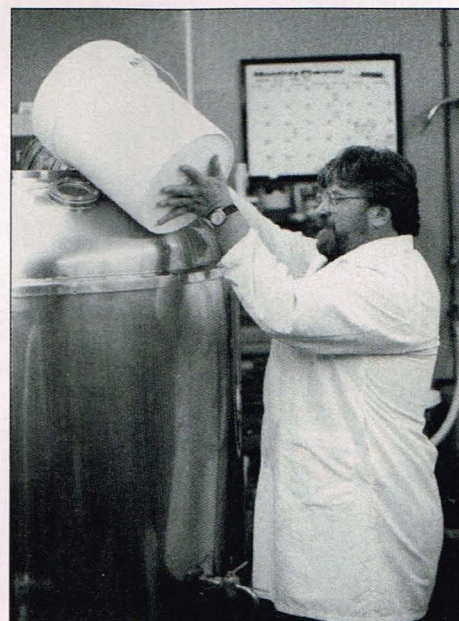
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Don Gortemiller prepares the brew kettle for a batch of Columbus IPA. The beer took second place in the IPA category at the Great American Beer Festival.

NICO FRECCIA



Brewing consistent, high-quality beer helped make Pacific Coast a cornerstone of Oakland's revitalized downtown.

local homebrew supply outlet.

Why does a commercial brewpub such as Pacific Coast choose to go extract? And how do they handle large quantities of extract in the brewhouse?

Don Gortemiller, brewmaster at Pacific Coast, began as a homebrewer in 1975 when friend and partner Steve Wolff gave him a homebrew kit for Christmas. His first batch of beer (a stout) actually tasted good, he says, and his brewing interest and techniques quickly advanced. In 1983, after the first brewpubs in the nation opened, Gortemiller and Wolff began to think about going pro.

"I was making good beer, always using extracts, winning awards, and the idea just came up," says Gortemiller.

Pacific Coast was an extract brewery from the beginning for several reasons. First, the building that they were eyeing would only accommodate a basement brewhouse. That meant lack of space for grain storage and milling, spent grain removal, and low ceiling clearance for augering.

Second, the original Pete's Wicked Ale brewhouse was on the market across San Francisco Bay in Palo Alto. The brewhouse was designed for extract use. Gortemiller snatched it up and decided extract was the way to go. "Every brewery is different, and you do what works for your location. I'd hit on extract recipes that worked and didn't see any reason to spend the extra time or money [on an all-grain system]," he says.

From the start Gortemiller has used the best quality, palest, and most neutral-flavored extract he could find. Using a neutral extract base allows him to create distinctive beers by adding specialty grains. At first Gortemiller used nylon bags, steeping the grains in the kettle. After a few tries dunking 50 to 60 pounds of hot, wet grain, he quickly switched to a homebrew-style lauter tun—a 50-gallon plastic bucket with slotted copper

manifold. Now he employs a 75-gallon stainless steel mash tun for specialty grains. He has proven that he can create virtually any ale style he chooses.

Because he is dealing with specialty grains that generally don't have enzymes, precise mash temperatures are not as important. He uses a high enough temperature to dissolve sugars and starches and extract color without imparting grainy or tannic

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flavors to the beer. The 150° to 160° F range is ideal.

Even though he uses large quantities of extract, Gortemiller's brewing process is really no different than that of the homebrewer. He offers a few ideas on how to better use extracts:

Choosing Your Extract

Historically, brewing beer has

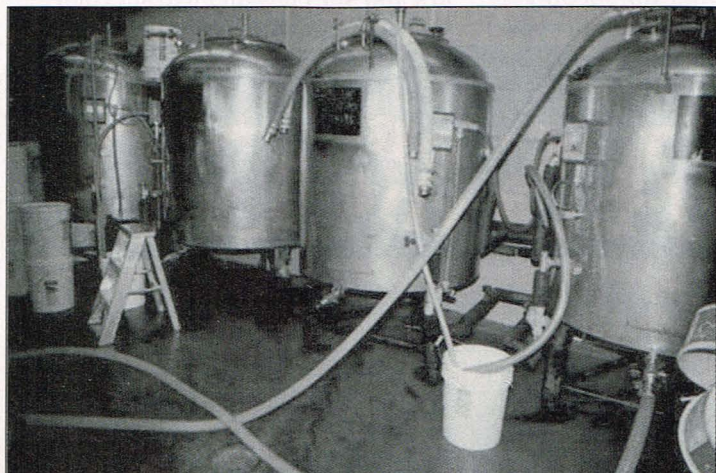
always been a local process. Beer is the product of the best available local agriculture (grain and hops) and water. Malt extract should be no different. The pre-eminent American extract producers generally use high-quality American malts from the closest growers and maltsters.

When choosing an extract, think about the style of beer you want to make. Read the labels on the can or ask your retailer for more information about the drummed products. Many extracts available on the market are made in far-off countries and, apart from the different malts being used, the products are often more con-

centrated to aid in stability. Foreign extracts will make excellent beer, but realize that the color and flavor might be quite different from a locally produced malt extract.

The Extract Process

American extract makers generally aim for an extract with a gravity of 78 to 80° Brix (a measure of specific gravity based on the Balling scale). Imported malts will often have a gravity of up to 85° Brix. This difference has several important implications for the homebrewer. First, to achieve the higher gravity, the extract



The fermenting tanks. The brewery's products include three standard beers and four to six rotating specialty beers.

Though the all-grain vs. extract debate will rage on, the truth is that lots of people, from beginners to advanced homebrewers to commercial breweries, are using malt extracts.

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"Every brewery is different, and you do what works for your location. I'd hit on extract recipes that worked and didn't see any reason to spend the extra time or money (on an all-grain system)."

maker must evaporate more water. That means applying more heat in the vacuum. Though it seems small, that five to seven degrees Brix difference in gravity can significantly affect the color and caramel flavor of your beer. Second, the lower gravity extract will be thinner and therefore more manageable. It will pour and dissolve more easily.

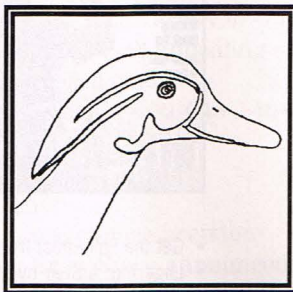
Using Extract in the Pub-Brewery

While there are no major differences between handling extract in the commercial brewery or the home, a few hints may be helpful. In the brewery the water is brought to a boil, the heat turned off, and the water recirculated through a pump as extract is added. Extract, as it is much heavier than water, will sink to the bottom of the kettle and burn if heat is still being applied.

The extract itself will become much more manageable if heated to 80° or 90° F first. At home this is easily accomplished by placing extract cans in hot water for several minutes before use. Pour the extract in slowly, stirring constantly, with the heat off to fully dissolve it.

Though the all-grain vs. extract debate will rage on, the truth is that lots of people, from beginning to advanced homebrewers to commercial breweries, are using malt extracts. The quality of extract gets better all the time, and no one can argue that extracts don't make great beer. Aside from the ease of using extracts and the minimal amount of space and equipment that extract brewing requires, brewing with extract is cleaner, faster, and easier for those people that like to take an afternoon to brew and hopefully a little longer to enjoy their own beer.

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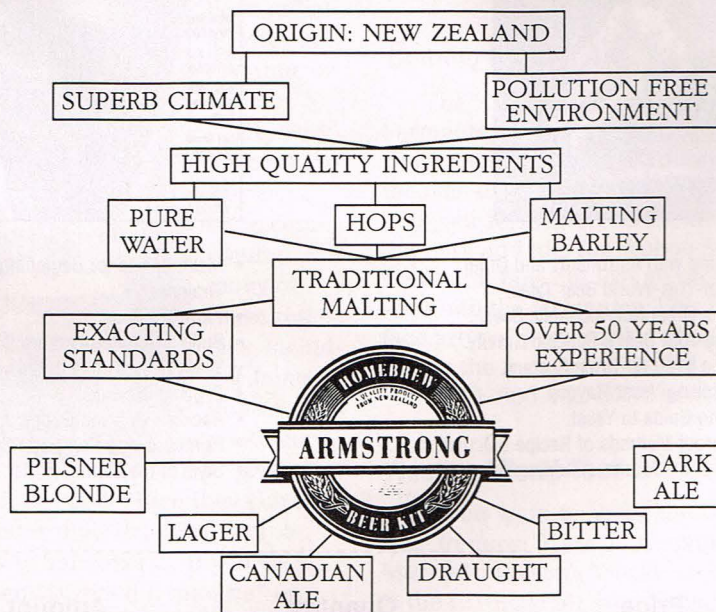
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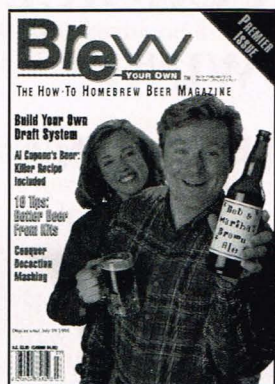
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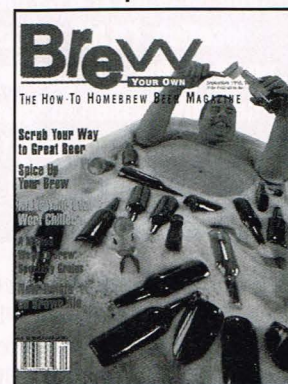
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August



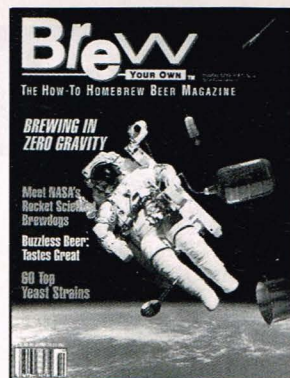
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September



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- Style of the Month: American Pilsner.

November



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Wicked Cool

For shoppers who never know what to buy their favorite homebrewers or for homebrewers who know just what they want, Pete's Brewing Co. introduces its new Winter Wicked Ware Catalog. It features the best beer merchandise an enthusiast (or anyone else!) could ask for.



Check out their homebrew bottles, pint glasses and pitchers, tap handles, and a whole line of hats

and tee's with a selection of Pete's logos. Also, Pete thinks no room could be complete without the company's Wicked pub mirrors and tin signs.

To receive a Wicked Ware catalog, grab that phone and call 1-800-877-PETE!

Winter Brew

Cooper's new kit, "Classic Old Dark Ale," will be available for Christmas brewing. It is a blend of crystal and roasted malts, which give the beer a deep ruby color. Cooper's has added Pride of Ringwood Hops to give the beer a fruity character. The beer is perfect for the homebrewer who prefers a darker style with body and flavor for a winter project.

Look for it at your local brewshop.

An Unusual Label

As the holidays approach, many a smart and generous homebrewer will be hard at brewing to give family and friends bottles of the elixir of life (okay, maybe it is homebrew).



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personalize any one of their designs for you or create a custom design on your behalf. Printed on premium peel-off label stock in a variety of colorful designs, they are as appealing as the brew you labored over.

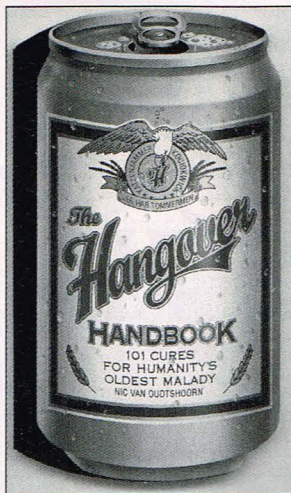
For a catalog call 1-800-645-1408.

Bopping Around the World

Get ready to see more brew-on-premises! The Brew Store announced that it has recently supplied the goods for four more U-Brews in the United States. It seems that BOPs are flourishing all over the world. There are seven more US openings scheduled for the fall, and a new BOP will be opening in Auckland, New Zealand as well.

Hair of the Dog, Volume I

Welcome to *The Hangover Handbook* by Nic Van Oudtshoorn. It offers 101 cures for a condition most beer



lovers have been afflicted with at one time or another.

Expect to have a happier buzz upon completing many of these remedies, including James Bond's proposed cure.

Did you

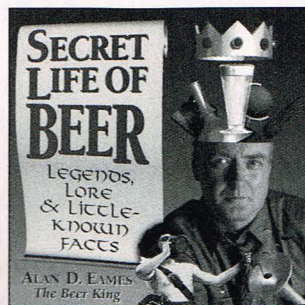
know that in Puerto Rico they rub a lemon under their drinking arm to chase away hangovers? If you've never tried "Distilled Dynamite" or "Dry Gunpowder," the *Hangover Handbook* will tell you how to concoct them. At the very least it will amuse you while you lie in bed moaning.

Published by Mustang Publishing Co., the book is available at your local

bookstore, or you can order by calling (901) 521-1406.

More Than Just a Drink

In *The Secret Life of Beer* by Alan Eames, the self-titled "Beer King" has compiled what he terms "legends, lore, and little-known facts." Here you will find ancient drinking songs (recounted by the only guy in the room sober



enough to remember what they sang), excellent quotes from famous drinkers, and beer stories and

history from around the world.

Published by Storey Publications, this book would make a good gift for the trivialist in your life. Take a peek before wrapping, however, because there is some wisdom worth keeping, such as "There are more old drunks than old doctors."

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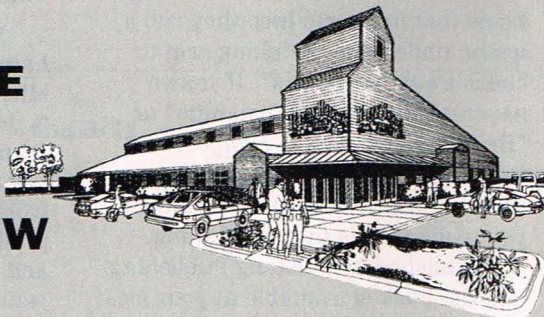
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CIRCLE 77 ON READER SERVICE CARD

Computer Whiz, Beer Lover, Brewer

by Steve Johnson

It all started at a company picnic in 1990. Ken Piel and Jim Dallarosa worked for a computer graphics company in Denver. Ken was a software programmer. Jim was a digitizer, using software to put maps, electrical diagrams, and schematics into the computer. At the picnic they discovered they had more in common than just computers. They both enjoyed good beer—Ken brewed at home on weekends; Jim had recently discovered microbrewed beers.

The cases and kegs of homebrew that Ken brought to the picnic provided a flavorful contrast to the free but boring megabrews furnished by the computer company. A small band of beer lovers, Jim among them, gathered around Ken and his beers. He began to ask questions: "How do you make this beer? Where do you get your ingredients? What kind of equipment do you use?" This was the beginning of a long and fruitful relationship.

The two began to get together to drink Ken's beer and started talking about opening their own microbrewery. It wasn't long before they decided to stop talking and put their words into action. They created a business plan, found some investors, and established

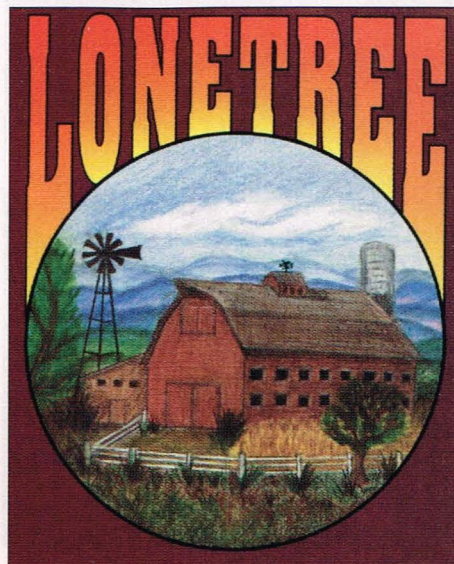
the Lonetree Brewing Company in March 1992.

Next step: Find a location. After some searching they settled on a spot in an industrial area on the north side of Denver in Adams County, just a stone's throw from the Denver city limit. The city provided all the utilities, including power, water, and telephone service. But because the location was actually outside the city limit, Ken and Jim avoided a whole roll of red tape in getting their licenses and meeting local regulations. In addition they avoided paying city real estate and employment taxes.

For equipment they scoured all of the farming magazines they could get their hands on. Ken, who grew up on a farm and had relatives in Nebraska, worked his farming connections. Eventually, the brewing entrepreneurs found what they were looking for: converted dairy tanks for mashing, fermenting, and hot- and cold-water storage. Since starting Lonetree Brewing they have purchased equipment from Colorado, Nebraska, Wyoming, Iowa, and as far away as the Dakotas. The equipment was inexpensive and the conversion was not difficult.

Many microbreweries use dairy

tanks as a source for equipment. Ken says that it is due to two factors. First, the dairy business has been going through consolidation, and many dairies have had to increase capacity to compete. Thus, a lot of the smaller dairies have closed and



Ken Piel's farm background, evident on the label, helped get Lonetree started.

their equipment has become available.

Second, dairy equipment regulations have changed substantially. Much of the older equipment, although in perfectly good working order, no longer meets government standards.

This was once a plentiful source for brewers, but the equipment is becoming increasingly hard to find, according to Ken. A lot of it is being shipped to Mexico. Ken's advice is to "watch all the farm magazines, call quickly, and make a deal; otherwise, it will be gone."

Lonetree's pride is the 1929 "Missing Link" grist mill. It isn't much to look at, but it is just what they need. They found the mill on a hog farm in Nebraska, geared it down, and discovered that its 300-pound wheels crushed the malt, leaving the husks intact rather than grinding them. That made for a perfect mash.

"We get a lot of comments from other brewers saying they wish they could handle their grain as easily as we do ours," says Ken. "The mill works very well. We crush, not grind. And that makes a lot of difference. You



Jim Dallarosa cleans one of the original fermentation tanks, which were converted from dairy equipment.

don't get a lot of the harsh, astringent flavor off the husk. We don't have to recirculate off our mash. And we never get a stuck mash. I can't say enough good things about it. We get a 73 per-



The "Missing Link" grain mill came from a Nebraska hog farm. Ken Piels refurbished it for use in the brewery.

cent starch-to-sugar conversion rate in the mash, whereas most brewers get only 68 to 70 percent."

For a brew kettle they use a steam-jacketed, 420-gallon Campbell's Soup kettle from Ohio.

In late 1992 Ken and Jim began to put their brewery together using 300- and 400-gallon dairy tanks. By December Jim, who was doing most of the electrical and plumbing work, quit his day job to devote all his time to the brewery. Out of economic necessity Ken kept his job until August of 1994.

They brewed their first batch in April 1993. At first they made half batches, about 150 gallons or five barrels. The first three beers were Country Cream Ale, Iron Horse Dark Ale, and Sunset Red Ale. Ken and Jim brewed together, and because Ken was still working all day he had to brew on weekends or take vacation time. By the time their first beer went on the market, they had invested about \$80,000.

The initial beers were fermented for seven days in horizontal, oval-

shaped tanks and bottled on the eighth day. They were unfiltered and hand bottled in 22-ounce bottles. They added glucose (corn sugar) to the batch before bottling. This process, called bottle conditioning, naturally carbonated the beer in the bottle. Unfortunately, the beers had to condition for 30 days before they were ready for release to the distributor.

The first year they were able to produce 326 barrels. That autumn they won the gold medal for their Country Cream Ale at the Great American Beer Festival.

I tasted the beer at the festival and at the brewery on the same day. I found the beer at the brewery far superior to that being served at the festival. When I mentioned this to Jim, he said they were from different batches, the batch at the brewery having two extra weeks of bottle conditioning. This was an excellent demonstration of how important it is to give beer the proper amount of conditioning time.

Production doubled to 625 barrels in 1994. The projection for 1995 is 2,000 barrels. To keep up with increasing demand, they added 800-gallon Mueller O-H Dairy tanks, in some cases substituting them for the 300-gallon fermenters. Instead of hand bottling they leased a Meheen bottling machine. The labels are still attached by hand.

Growth has precipitated many changes at Lonetree. In addition to brewing operations, Ken now takes care of the paperwork and financial affairs. Jim handles all the mechanical and electrical expansion. Dan Oravez was hired as a part-time head brewer. He works at the brewery two or three days a week. Other times he works for REI Sporting Goods as a bicycle mechanic and is an avid cyclist, skier, and homebrewer.

Another expansion-driven change is the way Ken and Jim make the beer. They examined the fermentation and packaging processes, their chief concerns being the length of production, clarity, and product stability. Originally it took more than a month for the beer to be ready to drink—eight days for brewing, fermenting, and bottling and 30 days for bottle conditioning. As a homebrewer, Ken was accustomed to

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producing unfiltered, bottle-conditioned beer. "Filtering and artificially carbonating were the cheater's way out," he said. On the other hand unfiltered, bottled-conditioned beer was too hazy for the microbrew market. It also lacked stability and had a relatively short shelf life. Ken says, "Americans still want their beer crystal clear."

He stuck to his guns on filtering, and to clear the beer they now fine (clarify) the wort in the kettle to reduce the protein. After primary fermentation they pump the beer to a secondary 800-gallon tank, where the temperature is reduced to 34° F to drop out more protein and yeast. Whereas fermentation originally took seven days, it now takes about 11 (seven days in the primary and four days in the secondary).

The one sacrifice they made was in bottle conditioning. They use a bright beer tank manufactured by Specific Engineering for artificial carbonation. Now the beer is ready to ship in only 12 days and is clearer and more stable. There is still some yeast in the

beer when it's bottled. The yeast continues to work in the bottle, fermenting the beer a bit more. Importantly, it also continues to eat up oxygen.

The beers still have a little chill haze, due to the absence of filtration and because they are brewed from six-row pale malt (which is higher in protein) instead of two-row malt. Ken says the quality of six-row has improved to the point where the average person can't tell the difference in the finished product.

Recently Lonetree has begun to make contract and private label beers. They are currently making Snow Dog

Ale for a local company, as well as Horizon Honey and High Point ESB for the High Point Brewing Co., Ancient Whale Ale for the Atlantis Brewing Co., and Raspberry Whacker and Lazy Lizard Lime for the Pine Street Brewing Co. Jim and Ken were eager at first to get into the contract and private-label market, but demand has been so great they have begun to turn away potential customers. Lonetree labels are now being distributed in Colorado, New York, Delaware, Vermont, New Jersey, and Massachusetts.

Lonetree Brewing Co. is located at 375 East 55th Avenue, Denver. Tours are conducted on Saturdays. Be sure to call (303) 297-3832 for directions and an appointment. Beer by the case is available at the brewery. A tasting room is under construction. ■

Steve Johnson lives in Clemson, S.C., and is author of two brewery guide-books: On Tap: A Field Guide to North American Brewpubs and Craft Breweries and On Tap New England.

Jim and Ken were eager at first to get into the contract and private-label market, but demand has been so great they have begun to turn away potential customers.

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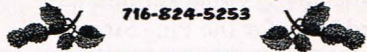
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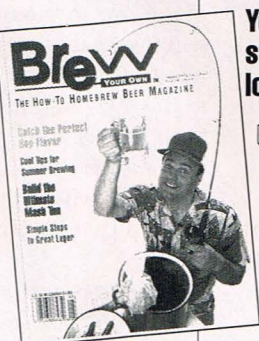
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Extremely Ridiculous Pilsner

by Randal James Richardson

Tradition, purity, quality. To some these words evoke certain standards of excellence. Many brewers who pride themselves on being rational, full of common sense, and not the least bit pretentious find purity and quality to be synonymous with good brew. There are those of us, however, who might carry the standards too far. I plead guilty.

Recently, I decided to brew up an extremely traditional pilsner. The operative word here would be *extremely*. I will recount my procedure with the amounts left vague to protect the foolhardy from repeating it.

I started with the water. No, I did not import 10 gallons from the Czech Republic. I did, however, buy distilled water, which I then purified further with my own home distiller.

I did some research, then decided to match the brewing water of the town of Plzen (birthplace of the pilsner style) by approximating the mineral count there: seven parts per million calcium, 6 ppm sulfates, 8 ppm magnesium. To achieve this I carefully added 1/8 teaspoon of food-grade gypsum, a pinch of Epsom salts, and just a touch of table salt. Exact and precise, right? Actually, more like using a chain saw to carve a turkey.

Then came the grain. After reading about German brewing, I decided to do a triple decoction mash using under-modified grain, an insulated cooler, and blankets.

To help the enzymes convert the starch, the mash must be held at certain temperatures for various periods of time. Since I was using a plastic cooler, I could not apply direct heat without creating a toxic mess. So I preheated the cooler with hot water, then wrapped it in blankets. Once the cooler was hot, I drained the water out. Then I added the grains and hot water, closed the lid, rewrapped the blankets, and waited 20 minutes.

Next, I took part of the mash,

boiled it 20 minutes, returned it to the cooler, and rested for 30 minutes.

Two more of these decoctions followed. The kitchen was becoming messier each time, but I persevered.

Fortunately, sparging was fairly simple. Using another preheated cooler filled with several gallons of 165° F water, I created a slow trickle over the grain bed. With luck, helped along by the warm house and heat-generating action of the enzymes in the mash itself, I was able to maintain the correct temperature. This produced a nice tasting, mildly sweet wort. The kitchen was a disaster of

in a huge washtub full of ice.

Fermentation came next. Most lagers ferment best below 50° F. Still, I refused to use a refrigerator. I opted instead for a cool basement and the large washtub, which I filled with water and blocks of ice.

I would not recommend this for several reasons. First of all, a full carboy bobs precariously in a tub of water, so I had to secure it with ropes. Also, to keep the water below 50° F, I needed countless bags of ice, jugs of frozen water, and the freezers of patient friends for storing all this ice. Twice, sometimes three times a day, I added ice or cold water to maintain the temperature. After several weeks the sugar content stabilized, and I could move to the next step. I bottled, then did the final lagering. Again, I called in my old pal the washtub and lots of ice day after day after day...

Two months passed. Time for the moment of truth; I tasted the beer.

It was amazing. Immediately I knew I had transcended normal beer. I had crafted an exceptionally superb pilsner.

Okay, not quite. Objectively, it was a pretty good beer. Like most decent lagers it was especially pleasing on summer days. But it wasn't going to rock the world.

Would I brew again in this ridiculously extreme way? Not likely. However, honesty forces me to note that I did not give an unequivocal "no" in answer to the question. Something still fascinates me about brewing with what I think of as "purity"—adhering to the style and methods of past masters. Keeping their spirit and technique alive in my beer is part of what I strive for when I homebrew. I just have to keep that desire under control. ■

Do you have a story for Last Call? Write to BYO, 216 F St., Suite 160, Davis, CA 95616.



The author discovered the simple life can be complicated.

grain-spattered counters, soggy blankets and, in the doorway, a frowning but understanding spouse. After promising to clean everything, I boiled the wort.

Since the gravity was so low, I knew I had to boil off some water. That would decrease my anticipated 10-gallon batch by a few gallons but would result in very clear beer. Once the cooking was finished, I chilled the wort

Thanks

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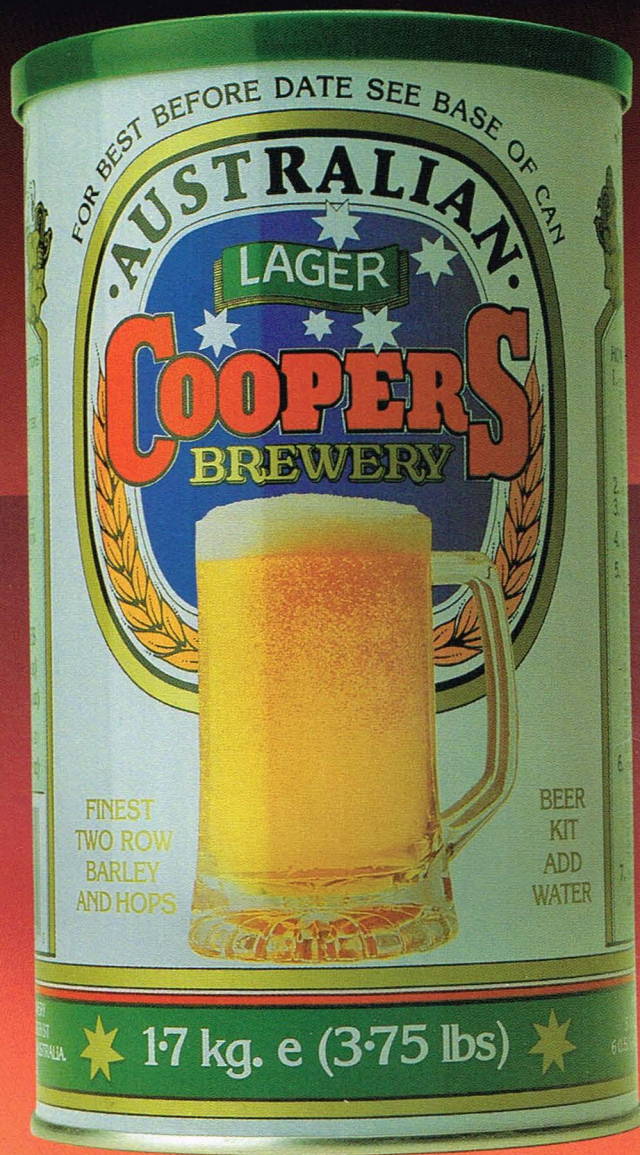
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