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April 1998, Vol.4, No.4
Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

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**First Person: My Week
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2. Add grain bag to 2 gallons

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larger) pot. Place over medium
heat. Bring temperature to

170°F and hold for 20 minutes.

3. Remove and discard grains and boil

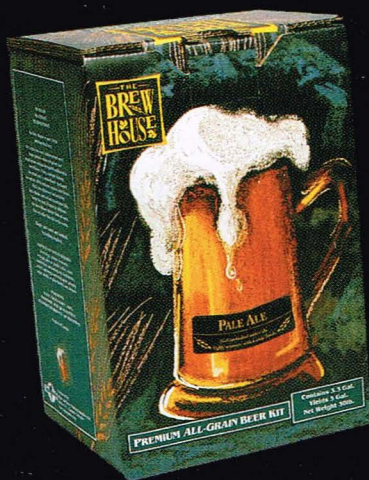
for 20 minutes. At the end of the boil, add
Saaz hops, remove pot from heat and steep
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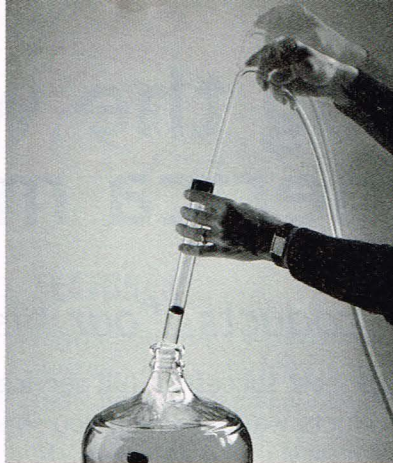
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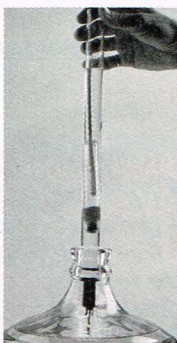
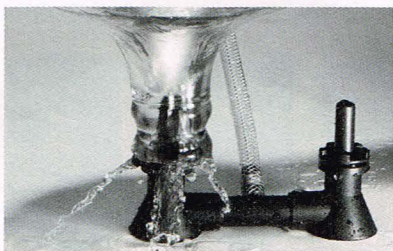
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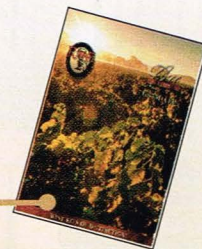
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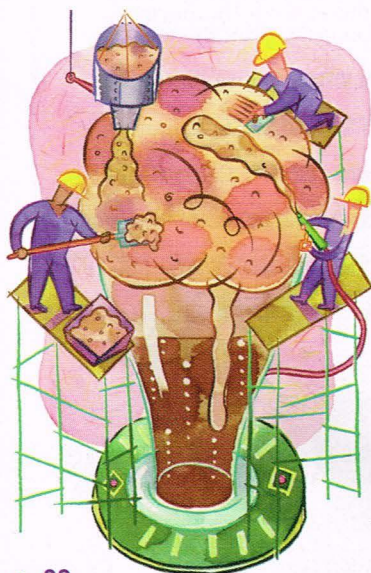
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A Few New Olympic Events

I hope you can stand reading one more column about the Olympics, because I'm still basking in the glow. Of course, if I were president of the International Olympic Organizing Committee, I'd change a few things. Specifically, I'd add some events for homebrewers. Here are a few that belong in international competition.

100-Meter Boilover: When the starter yells, "You'd better clean up the kitchen when you're done!" the race to the stove is on.

Homebrew Biathlon: Ski from station to station, aim an overcarbonated homebrew at the target glass, pop the cap, and fire away!

Speed Siphoning: Suck-and-spit method only. This is about individual skills, not technology.

Freestyle Bottling: Lose a tenth of a point every time you spill, two-tenths every time you overflow or underfill. And the Russian judge has been known to mark brewers down for clanking the bottles.

Triple Hop: Make three correct hop additions to your boil. Includes choosing the right hops, weighing them, and adding them at the precise time. Be careful of the third addition. So many athletes have trouble just at the end of the program, when after an hour of successful brewing and, of course, sampling, they "tire."

Synchronized Brewing: The event for couples who can't agree on a recipe.

Platform Sanitizing: Drop items to be sanitized into an over-chlorinated pool from levels of 10, 20, and 50 meters. Spectators ooh and ah, "Check out that carboy triple flip with a twist!"

Kegsledding: It's all about PSI. Slide down the specially made course atop your soda keg, then pour a beer from it. Speed counts, and too much foaming will kill you.

Mashnastics: Skills include the double decoction and the upward step infusion. All performed while wearing a leotard.

Curling: No ice required. No little brooms, either. And you only have to lift 16 ounces.

And by the way, in my Olympics we have a special rule for "dream teams." If you're a pro, you have to compete in at least one other event chosen by the Olympic committee. You're Wayne Gretzky and you think it's fun to teach the Koreans a lesson or two about hockey? Fine, but you're taking a few runs down the two-man luge course, too. Remember to keep your head down, Wayne.

If you'd rather go for the gold using your artistic side than your athletic side, check out this month's cover feature, "Fabulous Foam." A top-notch head is the perfect cap to any beer. It makes the beer more attractive, gives it an added dimension, and lets the uninitiated know at a glance that your homebrew is at least as good as anything they can get at a store. Author Alex Fodor, a professional brewer who holds a degree from the prestigious University of California, Davis, brewing program, shares the secrets of creating a perfect head. The story begins on page 32.

Also, be sure to check out "My Week as a Pro Brewer" by Gordon Power. It's the story of Gordon's initiation into the world of professional brewing. He developed a passion for homebrewing, then convinced a brewery to take him on as an apprentice for a week. The story is about his experience and the tips he learned that improved his homebrew. It starts on page 28.



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EDITOR Craig Bystrynski

MANAGING EDITOR Gailen Jacobs

ASSOCIATE EDITOR Suzanne Berens

TECHNICAL EDITOR Ashton Lewis

EDITORIAL ASSISTANT Julie Slama

ART DIRECTOR Christine Kell

GRAPHIC ARTIST Stephanie Gage

DESIGN CONSULTANT Kristine Bybee

CONTRIBUTING WRITERS Alex Fodor, Nico Freccia, Stan Hieronymus, Daria Labinsky, Scott Russell

EDITORIAL INTERN Debra Pettrici

MARKETING DIRECTOR Steve Rank

ADVERTISING DIRECTOR Corey Gerhard

ADVERTISING MANAGER Evan Shipman

ADVERTISING COORDINATOR Amanda DeCarli

CLASSIFIEDS COORDINATOR Elisa Brewer

CIRCULATION MANAGER Karen Embry

ACCOUNTING MANAGER Stacey Horgan

PUBLISHING ASSISTANTS Frank Bernard, Katie Landau

WEB MASTER Heidi Larson

CIRCULATION CONSULTANT Maureen Kaminski

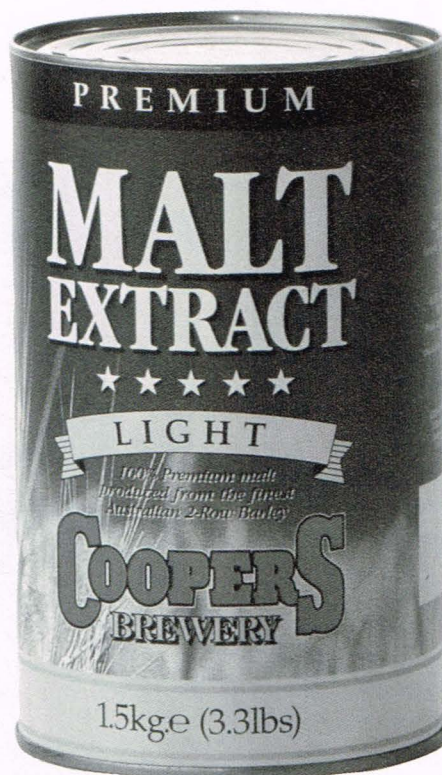
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The Return of a Classic, With a Classic Porter Recipe



Pawky Porter

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Recipe by Mark Henry

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1 lb extra-dark dry malt extract

1/4 lb Chocolate malt

1 lb 60°L Crystal malt

1/4 lb Special B malt

1 lb invert sugar

1 tsp calcium chloride

2 oz Willamette hops (60 min)

1 oz Liberty hops (20 min)

1 oz Liberty hops (dry hop)

14 grams Coopers Ale yeast

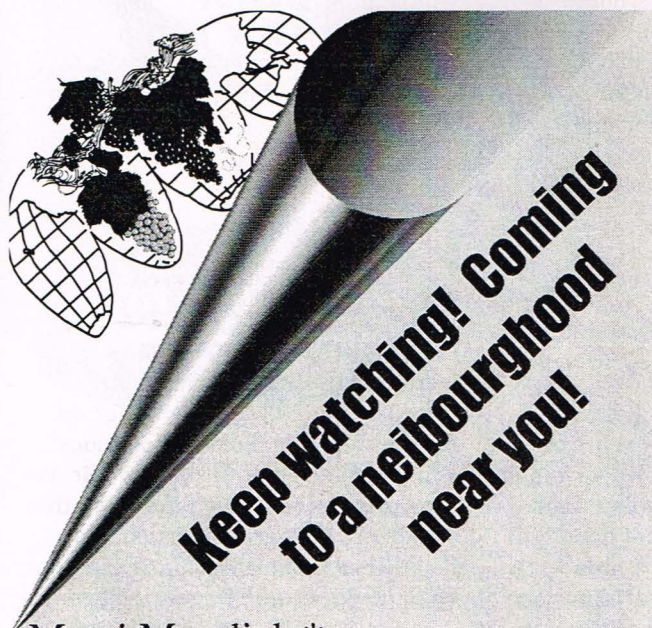
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Teachers Who Brew

Gary Meal East Springfield, Ohio

I have been an industrial arts teacher at the high-school level for the past 26 years. In this field I am quite a Jack of all trades. I have many interests and hobbies, including cooking.

Several years ago the woman I was dating suggested that I brew beer because I enjoy cooking so much. That suggestion led to many changes in my life. Janet and I began to brew. We made some pretty awful beers in those early days. Basically, we were inexperienced and had gotten some bad advice. After extensive research and lots of trial and error, we began brewing some rather awesome beers. We found that we both enjoyed brewing a great deal and since supplies were difficult for us to obtain locally, we decided to open our own retail store. We called it JC Homebrewing Co., which I named after my brewing partner. We offer supplies and equipment for homebrewers as

well as winemakers. Soon after, my brewing partner and I married.

Because we had started out brewing such bad beer, we decided to offer beginner and intermediate brewing classes for novice brewers in our store. This seemed a natural for me considering my years of teaching in a classroom. We have also expanded to teaching winemaking classes (since my wife comes from a long line of winemakers). Nothing gives me more pleasure than to share my experience and love of this hobby with others.

This past summer I was honored to win a second-place ribbon for my Gold Rush Ale, which is a California steam

beer, and a third-place ribbon for my Dauschbrau, which is a Kölsch beer, at the Ohio State Fair Homebrewing Competition. This was my first competition, and I was so pleased to have my beers place.

I can't remember ever having a hobby that has changed my life so drastically!



Gary Meal, pictured with his wife and brewing partner, Janet, extends his knack for teaching to homebrewing.

Rose Murphy Rough and Ready, Calif.

I've been a teacher in California since 1988. I've taught six years of elementary school and now teach high school English in Grass Valley, Calif. One particularly convenient benefit to being a teacher is having a little vacation now and then that allows me to enjoy my hobby: homebrewing.

It was only three years ago when I began using canned kits to make my beer. The store where I bought these kits was collecting names of people who were interested in starting a club. My husband and I, being new to the foothills and anxious to learn more about brewing, signed up and the story blossoms from there.

The Mountain Masher's Homebrew

Club began. My husband and I increased our knowledge about brewing. Our club brewed all-grain batches together, held competitions, and even judged at the county fair. We soon discovered a new local store that sold fresh, bulk grains, malts, and hops. I began hanging out at that store on Saturdays while Renee, the owner,



Vacations from school allow Rose Murphy to pursue homebrewing.

STRANGE INGREDIENTS!

What's the strangest ingredient you've ever added to your brew? Tell us about it and send us a picture of you and your ingredients. There's a cool BYO T-shirt in it for you. Send your story to Pot Shots, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at edit@byo.com. Be sure to include your mailing address!

You can't beat the taste of homemade beer.



I've always enjoyed good ^{wine} beer, and since I found out how easy it is to make ^{wine} beer at home, things are great! There's nothing like pouring a tall ^{glass} mug of ^{buttery} crisp, ^{oaked Chardonnay} hoppy Pilsner, or ^{dark} rich, ^{fruity} malty Zinfandel Doppelbock, and seeing the looks on your friends' faces as they say, "You made this?"

And home ^{winemaking} brewing is easier than you might think—I was making my first batch of ^{wine} beer in under an ^{twenty} hour.

I'm my own ^{winemaker} brewmaster! It makes me proud to hold up a ^{glass} full-bodied mug of ^{Cabernet Sauvignon} hoppy ~~pat~~ ale and say, "I made it myself."

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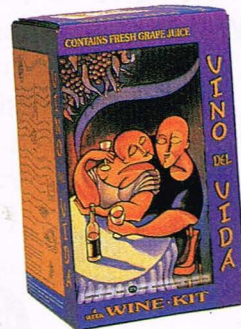
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gave brewing demonstrations. I continued to learn. They say learning is a lifelong process.

The second year of the club I became the Mountain Masher's secretary and took on editing our club's monthly newsletter. (It was summer, so I had time). Then my friend Renee decided she would close her store. My husband and I couldn't believe it. What would we do? Luckily, we had a good friend and housemate who was willing to work at the store when my husband and I couldn't. So after a little discussion we bought the homebrew store! It is open just 20 hours a week. I spend my time there on school vacations mostly, and between my husband and our friend Mike the store continues to stay alive! (And it's the perfect place to get my ingredients.)

As I write this I am sitting at the store. No school today, but during a quiet moment like this it's a great time to write lesson plans. Or maybe I'll work on a new recipe.

Happy Brewing!

Dave Porter Aztec, N.M.

I'm an outdoor enthusiast, teacher, and avid homebrewer. I've been dabbling in homebrewing and winemaking since BC (before children). I've learned a few things



along the way.

1. Adjunct: Source of fermentables other than barley.

2. Adjunk: What's added to the brew kettle when you're desperate for variety.

3. Autolysis: Yeast shock/death from nutrient deficiency.

4. Brewjester: Brewing idiot or someone who makes beer that tastes funny.

5. Defunky mash: Multi-step mash that doesn't come out right no matter what you do.

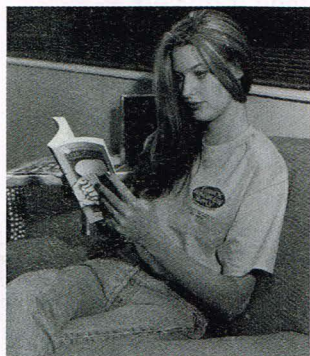
6. Degrees Bawling: Measure of a brewer's crying over a batch of brew gone bad.

7. Dextrin: Substance that removes body from homebrewers.

8. Gravity: Force that works after too much homebrew.

9. Confusion mash: Very first mash or trying to follow someone else's poor instructions.

10. Clod hops: Sturdy shoes worn to protect your feet from falling brew pots and carboys.



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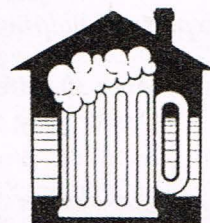
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Editorial and Advertising Office:

Brew Your Own
216 F Street, Suite 160
Davis, CA 95616

Tel: (530) 758-4596
Fax: (530) 758-7477
E-Mail: BYO@byo.com

Advertising Contact:

Evan Shipman, Ad Manager
ad@byo.com

Editorial Contact:

Craig Bystrynski, Editor
edit@byo.com

Subscriptions Only:

Brew Your Own
PO Box 1504
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Belgian Facts

Dear Brew Your Own,

"The Belgians Are Coming" (February '98 BYO) article seems to be a bit misleading. Namely, it suggests that Abbey and Trappist ales are something more than legal appellations...that such labels refer to actual ale styles when in fact they do not. In 1962 the Belgian Trade and Commerce Tribunal excluded commercial breweries from using the appellation "Trappist." This would be much like the Supreme Court in our country ruling that only Rogue could use the term "hand crafted" on its bottles (is "hand crafted" an ale style?).

As Pierre Rajotte pointed out in his book *Belgian Ale* (Brewers Publications), "The comments that apply to Trappist can also apply to the Abbey and vice versa," contradicting the article's attempt at defining Abbey and Trappist as unique beer styles.

To make this painfully clear, a Trappist monastery could produce a white beer and it would be considered a "Trappist ale," and a commercial Belgian brewery could produce a white beer, give the name a religious tag such as St. Bernardus, and the beer could be considered an "Abbey ale." I would have liked the article to more closely examine Belgian ales and their actual styles.

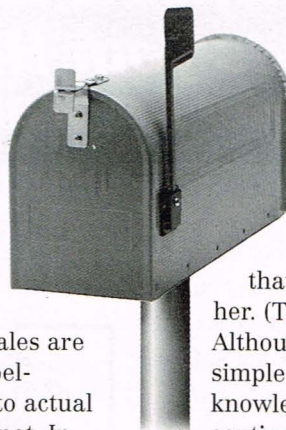
*Jim Pierce
Bothell, Wash.*

Steady Improvement

Dear BYO,

All right, I will admit it. Your magazine is making my beer better. It's true. Sure, doing little things such as using specialty grains, perfecting the boil, properly cooling the wort, and using liquid yeast are easy, but they are all adding up to a better brew. I have been brewing for slightly more than four years now. I started out making malt and sugar beers then slowly worked my way into all-malt brews.

I now enjoy using light malt extract and adding specialty grains and hops to approximate my desired style.



Dispensing the brews with my keg setup is where I have the most fun. My wife even says that I like beer more than her. (That's not true, really!) Although my brewery is very simple, I feel my skills, brew knowledge, and enthusiasm are continuing to improve with each new batch and issue of your magazine. Keep it up.

*Dan Gittinger
Lakewood, Ohio*

Cloning

Dear BYO,

I received the December '97 issue of BYO yesterday (Oh, the woes of being an international subscriber!) I was thrilled to see one of my recipes published in "Cloning: Not Just for Sheep." However, I noticed that in the conversion from metric to imperial something seems to have gone amiss. The corrected bits are:

- 10 oz. (actually 284 g.) of British crystal malt
- 10 oz. (actually 284 g.) of wheat malt
- 3 oz. (actually 2.82 oz. or 80 g. of Fuggles whole hops (4.5% alpha acid)

Having said that though, half the fun of homebrewing is experimenting. So I will probably brew up a batch of the recipe you printed, just to see how much difference it makes.

*Dave Jones
Zimbabwe*

Pot Trick

Dear BYO,

I read in the latest issue of a trick to keep your pot from boiling over (February '98 BYO, Mail). Well, I have another, less labor intensive trick. As the wort begins to boil and the foam rushes to the rim of your pot, take a spray bottle filled with water, and spray it on the foam of the wort. It brings the foam right down to a manageable level.

*Todd Mangis
Portland, Ore.*

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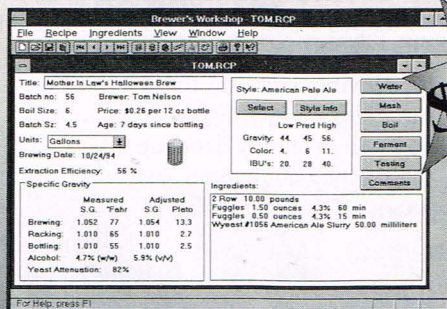
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Opening Day Special

by Scott R. Russell

If it's April, it must be baseball season. Must be, just because. So what if your team didn't win it all last year? Neither did mine. In fact the team that did win it all last year doesn't even really exist anymore. (Thanks, Wayne). Nevertheless, the thing that makes us die-hard fans come back year after year is the game itself.

Of course there are new players, different players, new hopes, and new frustrations, but that's baseball. And if someone like me can say that, then there's no excuse for anyone else not to feel that way. Why? Well, because my favorite teams are the Red Sox and the Expos. 'Nuff said, to the real baseball fans out there. If you're not one,

ask one.

And of course one of the great companions to a ball game has always been a beer. I don't mean the watered-down, \$4, light mouthrinse they sell at the



Ty Cobb's Georgia Peach Pilsner (5 gallons, partial mash)

Ingredients:

- 2 lbs. pilsner malt (preferably German)
- 0.5 lb. cara-pils malt
- 0.5 lb. Vienna malt
- 5 lbs. extra-light unhopped malt extract syrup
- 1 lb. rice syrup solids
- 2 oz. domestic Tettnanger hops (4% alpha acid) for 35 min.
- 1 oz. whole Hallertauer hops for 5 min.
- American lager yeast culture (such as Wyeast 2035), built up to at least 1 qt.
- 3 lbs. fresh peaches
- 7/8 cup corn sugar for priming

Step by Step:

Heat 1 gal. of water to 166° F, crush grains and add to the water, stirring in gently. Your mash should be about 154° F. Hold at this temperature for 90 min. Test with iodine for starch conversion, then begin runoff. Sparge with 2 gal. of water at 169° F.

Add the malt syrup and rice syrup solids to the kettle and bring to a boil. (Total boil time is 50 min.) Boil 15 min. and add Tettnanger hops. Boil 30 min. more. Add Hallertauer hops (tied into a cheese-cloth bag) and boil 5 min. more. Turn off heat and let cool 30 min.

Add to your primary fermenter with enough pre-boiled cold water to make 5.25 gal. When wort is cooled to 65° F, pitch your yeast culture.

Allow fermentation to begin at 65° F, then gradually cool to 55° F over the course of a couple of days (once fermentation has begun). Hold fermenter at 55° F for 10 days, then rack into secondary in which you have already placed the peaches, washed and cut up into small cubes. Lager at 50° F on the peaches for 15 days and then rack again to a third vessel. Lager at 40° F for three to four weeks. Warm up to 65° F for a day, then prime with corn sugar and bottle. Bottle condition at 45° to 50° F for three to four weeks, then play ball!

Variations and Options:

All-grain recipe: Same temperature mash, but increase the pilsner malt to 7 lbs., cara-pils to 1 lb., and use 1 lb. whole brewer's rice. Pre-cook the rice to gelatinize the starches for ease in conversion. You can also use flaked rice, if your supplier carries it, which doesn't need to be pre-cooked. Increase the mash water to 3 gal. and the sparge water to 3.75 gal. Be sure to test for conversion on this mash.

All extract recipe: Increase the malt extract syrup to 6 lbs., but do

steep the cara-pils and Vienna malts in the kettle water before adding the extracts. This version will not be as light in color, no matter how you do it.

Yeast: Use a clean, fresh lager yeast culture, and pitch big to get off to a good start. Any so-called pilsner yeast will work, but Wyeast's American lager strains are particularly suited to the style.

Peaches: Fresh? In April? Well, use what you can find. But don't use canned, syrup-laden cling peaches, okay? No preservatives, no additives, no sugar. Just fresh fruit. To get more flavor and aroma extraction, try cutting it up, then freezing it for the time the beer is lagering, then microwaving it before you put it in the fermenter. Many homebrew suppliers carry, or can order, canned fruits for winemaking, which are preserved in their own juice only. These will certainly work fine too, although I haven't used the peaches that come this way. Also available are a couple different kinds of peach (and other fruit) flavor essence. These are not usually flavorful enough to really pack a zing, but they can help if the result at bottling just doesn't have enough to it. They can be added with the priming sugar, an ounce or two for five gallons.

park these days. I'm talking beer. The two traditions go hand in hand and have for a long time. Many ball clubs have been owned by breweries and brewers. Many teams have been sponsored by breweries and beer brands. And there's even a team called the Brewers. The Yankees were once called the Knickerbockers (before the NBA team existed, of course). That sure sounds like a beer name to me!

Anyway, opening day is here, and you can't let an auspicious occasion like that go by without brewing something special, something commemorative. And so, to honor one of the greatest hitters of all time, I created Ty Cobb's Georgia Peach Pilsner. In one word? No, can't do it. Let's try crisp, complex, creamy, balanced, fruity, bitter, light, rich, all at once. Brewed like a classic American pre-Prohibition style lager, with a generous helping of hops and the taste of rice, but then lagered on peaches to give it a difference that will hit the strike zone of almost any beer fan.

Reader Recipe

Herb, Spice, and the Texas Winter Specialty Lager

(5 gallons, extract and specialty grains)

I entered this beer in a Texas state competition at the encouragement of many friends and won.

Quint Floyd
College Station, Texas

Ingredients:

- 3.5 lbs. light malt extract
- 2.5 lbs. light dry malt extract
- 1 lb. crystal malt, 10° Lovibond
- 2.5 lbs. mesquite honey
- 6.5 oz. Cascade hops (4.3% alpha acid): 4 oz. for 60 min., 1 oz. for 8 min., 0.5 oz. for 5 min., 1 oz. for 2 min.
- 2 tsp. fresh ginger root
- 4 or 5 sticks of cinnamon, grated
- Orange peel from 6 oranges (white removed), grated
- 1/2 tsp. Irish moss
- Wyeast 2206 (Bavarian lager)
- 3/4 cup corn sugar for priming

Step by Step:

Steep malt in 1.5 gal. of water at 150° F. Remove grain bag. Add liquid to kettle with extracts, 4 oz. Cascade hops and honey and bring to a boil. (Total boil is 60 min.) Boil 50 min. Add ginger, cinnamon, orange peel, and Irish moss and boil 2 min. more. Add 1 oz. hops and boil 3 min. more. Add 0.5 oz. of hops and boil 3 min. more. Add 1 oz. of hops and boil 2 min. more. Cool to 74° F and top up to 5 gal. with preboiled cold water. Pitch yeast.

Primary ferment for 14 days at 50° F. Secondary ferment for 30 days at 36° F. Prime with corn sugar and bottle. Age beer for six weeks.

OG = 1.081

FG = 1.018 ■

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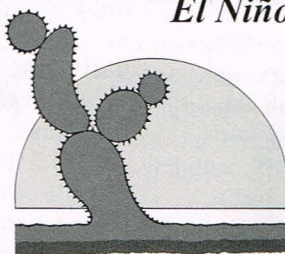
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When Speed Counts — Don't Tell!

Mr. Wizard

Dr. Fermento, what is the fastest time an all-grain homebrewer such as myself who bottle conditions his beer can brew, ferment, and have drinkable beer? I have been asked this question quite often by novices and I usually tell them 2.5 to three weeks. I then state that in order to do this a brewer must have a very active yeast slurry and a refrigerator.

*D.C. Barber
Sacramento, Calif.*

So you wanna know just how fast you can be sippin' your suds after brewing and you're afraid that your friends will be afraid of your beer if you tell them that it is 10 days old vs. 45!

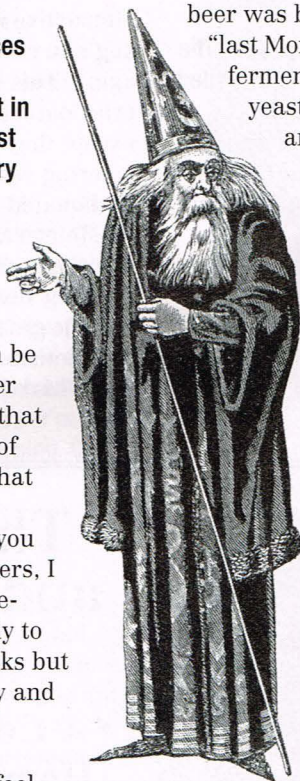
If the novices to whom you give advice are fellow brewers, I would tell them that a bottle-conditioned ale can be ready to drink in as little as two weeks but the beer may be very yeasty and have green flavors that will change over time. Most brewers, including myself, feel that a rushed brew is one that is just waiting to cause problems.

When I speak to non-brewers who ask such questions I tend to leave out the many short-cuts that are sometimes used in brewing and tell them the story that includes longer fermentation and aging times. An explanation that leaves people with the idea that beer can be brewed and ready to drink in a few days takes away much of the romance and craft appeal to specialty beers.

On the other hand, push can turn to shove and very drinkable beers can be made in short periods if you have the right tools. For instance kegs help decrease turnaround times in the brewery. At a Saturday mud football game a

fellow brewer brought a keg of porter to offer to the participants. We all were impressed with the rich, chocolatey flavors and clean yeast character in the beer and not one of us noticed anything off with the beer. When asked when the beer was brewed, our friend replied "last Monday!" Three days of fermentation, one day to settle the yeast at a very cold temperature, and one day carbonating in the keg was all the time available to make the big game.

There are some very well-known microbreweries in this country that have pushed their beers to keep up with the fast growth rate in the specialty-beer market. Some have pulled the feat off without a hitch and others have produced products of variable quality under the pressure of time. Homebrewers would be best advised to take this sound advice: "Serve no beer before its time."



Mr. Wizard

Recently I've been thinking about conducting my first mash. One of the reasons I've been gun-shy is fear of the dreaded stuck mash during the sparge. I would like to know the foolproof method of lautering (if there is such a thing) that will put me at ease. I would also like to know what to do if I encounter a stuck mash. Your help is greatly appreciated.

*Tom Bonacorso
Bronx, N.Y.*

I was once afraid of my first all-grain brew, too. For me it was not the stuck mash that I feared but hitting the mash temperature. My

brewing partner was the cautious type and feared pH control. Fears aside, we bought the malts for our maiden voyage and launched our careers as all-grain brewers. The day went okay, and at the end we had beer that we thought was great and our friends thought was good enough to drink.

The point is that homebrewers these days have too many good resources not to be afraid of something in the brewing process. My first tip is to begin by focusing on the very basic parts of the process and to forget about all the potential failures. Kind of like the first time you kissed a girl — if I knew then what I know now, I would have been shaking in my boots!

Needless to say there are no fool-proof brewing methods; there are simply too many things that can and do go awry. To minimize the chances of a stuck mash, focus on five key points.

1. Remember that the first step of the brewing process is milling. Malt that is milled too fine or in a manner that destroys the integrity of the husk can cause problems when it comes time to laut. Start the day on the right foot. Buy pre-milled malt, use a mill at your local homebrew store, or buy a mill designed to mill malt. Blenders, flour mills, and coffee grinders are not the way to start the day.

Some brewers use rolling pins or beer bottles to crush the malt, but this is extremely tedious. Impatient brewers like me give up quickly on such awkward tools and break out the margarita blender to finish off the task. This is not recommended!

2. Every process requires a tool. The first time you brew all-grain is not the time to be too creative with tools. Colanders, coffee filters, and the like will probably cause problems. Use a proven tool for your laut. The double-bucket method, a picnic cooler with a copper pipe manifold, and a large pot with a false bottom are three that work well. If you take the time to build a

good tool, you will greatly reduce the chances of a complete disaster.

3. Cover the bottom of your lauter tun with foundation water before filling it with mash. If air bubbles form beneath the false bottom, they will greatly impede the flow of wort out of the lauter tun. If you make this mistake once, you probably will never forget to cover the bottom again!

4. Don't let the top of the grain bed get dry. Grain is buoyant as long as there is water to keep it floating. If the grain bed runs dry, it will fall onto the false bottom and the chance of a stuck mash increases. Pay close attention during sparging. Add more water when needed or to increase the flow of water if you are using a sparging device.

5. Don't get greedy! If the wort flow is nice and steady and the wort is clear, don't try to make things easier by turning the lauter process into a race. Not only will your yield decrease if you collect wort too rapidly but your chances of sucking down the bed greatly increase. Take it easy and collect the

wort over a 45- to 60-minute period.

If you follow these five tips and still run into a stuck mash, don't panic! If you stop the wort flow, underlet the mash bed by introducing about one to two quarts of sparge water, very gently cut the grain bed several times with a long knife, and allow the mash bed to sit for about five minutes, you should be able to resume wort collection without any major problems.

Mr. Wizard

I am lagering a Bohemian pilsner. The recipe calls for a smack pack to be added at bottling time. Is this an accepted method, and do you recommend it?

*Ed Generose
Pueblo, Colo.*

The problem with brewing lagers at home is that the yeast almost completely settles out during lagering. This means that when it is time to bottle there may not be

enough yeast to carbonate the beer. To remedy the problem many homebrew recipes call for adding more yeast to the beer, usually in the bottling bucket, at the time of bottling.

The method works well, but adding too much yeast in the bottle can lead to yeasty flavors from yeast autolysis (yeast death and decay) if the bottled beer is stored warm for long periods. If you want to bottle condition a well-aged lager beer, then adding more yeast at bottling is a good idea.

If this doesn't appeal to you, an alternative is to age your lager in a keg and carbonate naturally during aging. This is how commercial breweries naturally carbonate their lagers, except they age and carbonate in large lagering vessels and then filter the carbonated beer prior to packaging.

To age and carbonate in a keg, rack your lager from the fermenter to the lagering vessel (a soda keg) when the specific gravity is 1.016 to 1.018 and complete the fermentation in the sealed keg. This will create sufficient pressure

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to carbonate the lager. The beer is aged in the same container. After aging you can either rack the beer under counterpressure into another keg or use a counterpressure filler to bottle.

If I had to choose a method to brew lagers at home, I would lager in a soda keg, rack the beer off the yeast after lagering, and either bottle it or serve it from the keg. This method avoids having to add more yeast, uses no priming sugar for carbonation, and removes the settled yeast before serving. The resulting beer would be a traditional lager beer that uses the same procedures as a commercial brewery minus the filtration step.

Mr. Wizard

No matter how many articles or references I read, there seems to be a disparity in the amount of water to be used in all-grain brewing for the mash and sparge water. I've read one quart per pound up to 1.5 quarts per pound for the mash and again anywhere from one quart per pound to 1.5 quarts per pound for sparging. Can you provide some clarification?

Steve Van Pelt
Santa Rosa, Calif.

Like the amount of malt to use or the amount of hops to add during the boil, the amount of water for mashing and sparging is not a constant. Some brewers like a thick mash and use less water per pound of malt than that needed for a thin mash. Mash thickness affects the rate of enzymatic reactions in the mash, the amount of unfermentable sugars left in the wort after mashing, the heat stability of malt enzymes, and the extract yield of the raw materials.

Depending on the type of brew being made, a thick or thin mash may work best. If the amount of wort being collected is constant, the remainder of the total water needed for mashing and sparging will be added in the sparge. In general for every gallon of wort produced after the kettle boil, you need about 1.5 gallons for both mashing and sparging. This translates to 7.5 gallons of water for a five-gallon batch.

I prefer a medium-thick mash and use three liters of water for every

kilogram of malt. This equals 1.44 quarts of mash water for every pound of malt. This mash thickness works very well for multi-temperature mashes in which the mash is heated in a pot, then transferred to a lautertun. For infusion mashes, slightly thicker mashes make a higher-gravity wort (before sparging) that floats the mash more than a thinner mash.

Like all things in brewing, there are

many approaches that produce excellent beer. Choose the thickness that works best for you. ■

Mr. Wizard's Address

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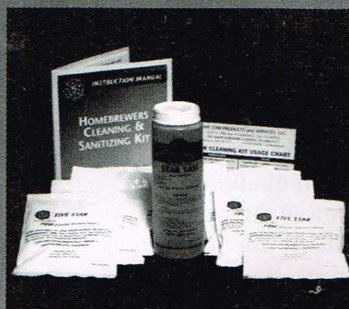


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Choosing the Right Yeast

by Suzanne Berens

Brewer: Steve Anderson

Brewery: Waterloo Brewing Co.,

Austin, Texas

Years of experience: 4

Education: Completed two courses at Siebel Institute of Technology in Chicago; BS in psychology from University of Texas at Austin

House Beers: Clara's Clara (blonde ale), Ed's Best Bitter, O. Henry's Porter, Guytown IPA

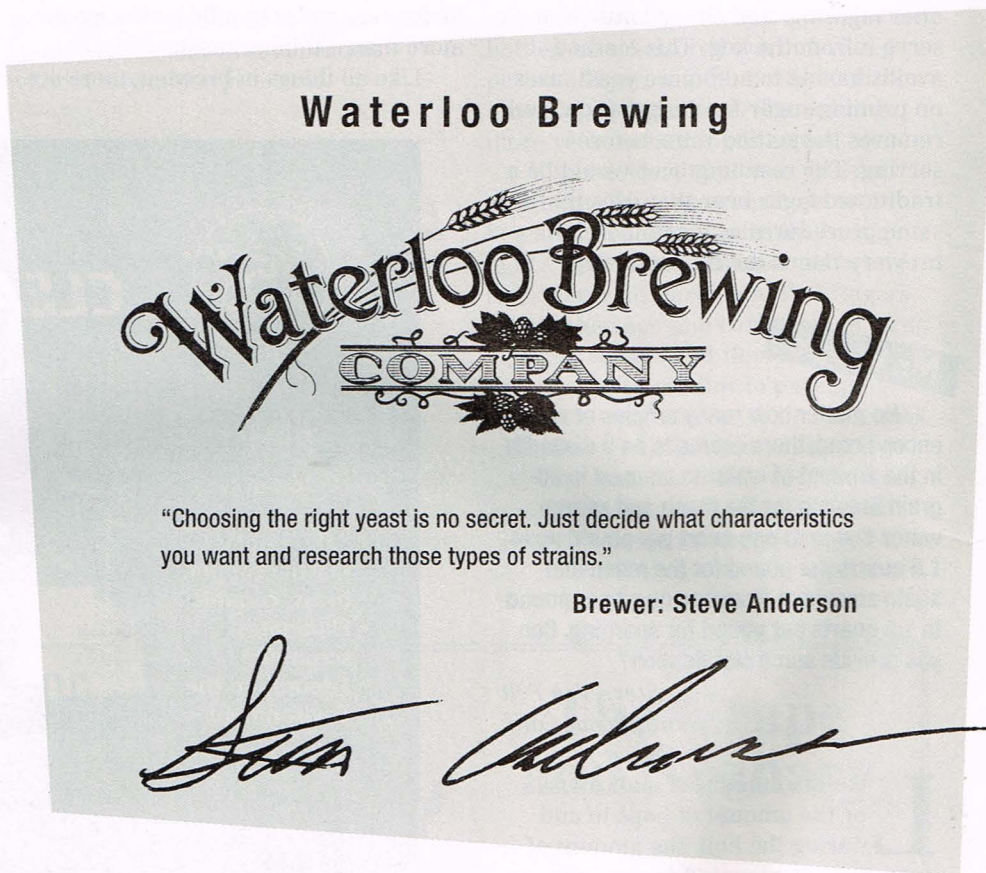
The first step to choosing the right yeast is obvious: Decide what qualities you want in your beer. Browse through the catalogs of yeast suppliers. We buy from Wyeast and use its booklet to check out what various strains do. Then just try them.

When we brewed our pilsner we made it with all Czech malt and all Czech hops. So to make it as authentic as possible we used a Bohemian lager strain, 2124. It is supposed to enhance the maltiness of the beer.

We first opened when there was a craze for Wyeast 1056 (American ale). It has wonderful, clean properties, but it didn't impart the kind of flavors we wanted for our beers. We were looking for a yeast strain that had more esters and was more English in character.

The yeast strain we use now for our house beers is Wyeast 1968 (London special ale). This strain gives us more of the English-style flavors we want such as a hint of ester and its ability to enhance the maltiness. It works well with our English-style bitter, a porter, an IPA, and a blonde ale. Using one versatile yeast for most of our beers also eliminates the need to keep other strains alive.

We wanted something highly flocculent, which 1968 is. We have



cylindroconical fermenters from which we can harvest yeast off the bottom. So with the highly flocculent yeast and the fact that we use finings, too, we have no trouble racking.

Using a low-flocculating strain would be difficult for us because we have no way to clarify the beer unless we run it through a filter. Even then it's a great pain because the filter clogs

quickly if there is a bunch of yeast going through it. We try to avoid filtering any of our beers anyway. Using this strain makes harvesting easy because it's all sitting either at the top or bottom of the fermenter. So for homebrewers (flocculent yeast) is very important because they don't have the kind of filtration systems we do.

Some strains attenuate more

The Tips

- Decide what characteristics you want your beer to have and consult yeast catalogs.
- Choose a highly flocculent yeast to avoid filtering and to harvest yeast for following batches.
- Choose a strain that is appropriate to the climate in which you are brewing.
- Choose strains that are less attenuative for more mouthfeel.

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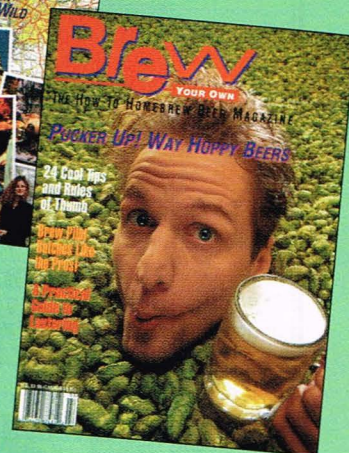
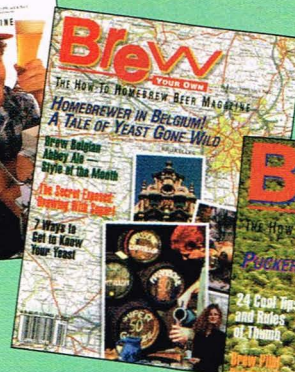
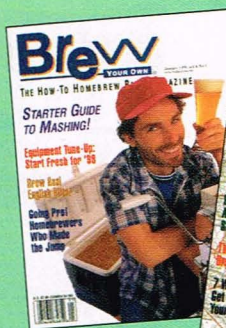
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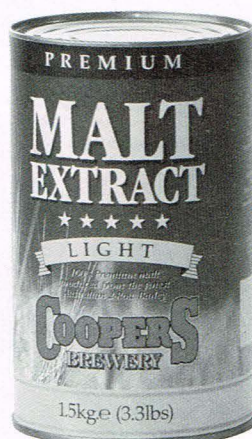
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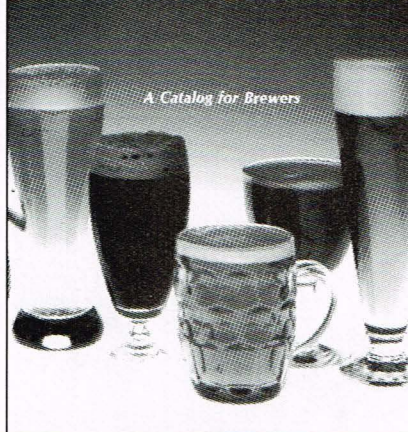
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Tips from the Pros

(ferment the beer more completely) than others. But to me that's secondary. Most of our beers end with a high gravity anyway. We like them to have a good mouthfeel. But keep in mind that attenuation is also affected by your yield, not just dependent on the yeast strain. If you want an American lager, you want a highly attenuative strain such as 2007 (Pilsner) or 2035 (American lager).

One factor to consider is how a strain does in a certain climate. Here in the South it is warm. Today it's 75° F, perfect for brewing. But in the summer it won't be, especially if you live in an older home with poor insulation and have to run the air conditioner to keep your beer from fermenting at 95° F. So choose a yeast strain such as 2112 (California lager) for steam beer or 1728 (Scottish ale). They won't suffer terribly because of fluctuations in temperature. That's why ale yeasts are most popular; they can ferment in warmer temperatures. And in my experience they are much hardier than lager yeast.

We use Weihenstephan weizen yeast for our hefe-weizen (seasonal), and the difference between fermenting at 65° F and at 70° F is tremendous. The esters, especially banana, are much higher in that high-degree range. The 1968, however, is very versatile. Although the beers I ferment at 63° F (porter and IPA) are high in gravity to begin with, the difference between fermenting at 63° F and at 68° F is negligible. But it's even hard to tell a difference with a milder beer. I've fermented our bitter at 65° F and 68° F — we have fluctuations with the glycol jackets kicking on and off — and I can't tell the difference.

For homebrewing, however, you are fermenting up to 75° to 80° F and will definitely see a difference. So if you want consistency and you are harvesting yeast, ferment at the same temperature because yeast acclimatizes to the environment from the first batch to the next.

Finally, experiment. I'm sensitive to diacetyl, but in some styles, for instance English ales such as Bass, it is desirable. So you can cross over somewhat if a strain has a character you like. You can also experiment with temperature. Look at steam beer: lager fermented at very high temperatures. ■

Traditional Scotch Ales

by Alex Fodor

With a brewing history dating to 43 AD, Scottish beer has had plenty of time to mature into a world-class beverage. With the craft-brewing movement channeling most of its energy into German and English beers, it is easy to overlook the contributions of the Scots.

Scotland is no stranger to the traditions of brewing. The country is home to Heriot-Watt University, a famed brewing school. And Scottish brewing traditions were popular in other countries as well. Prior to the success of India pale ale, Scotch ale was the favorite drink of the British colonies. The high alcohol content and

robust flavor made it an excellent choice as an 18th century export beer. Furthermore, Scotch ale is a favorite of the beer-loving Belgians. A Belgian couple sipping copper-colored Scotch ale out of the traditional thistle glasses is not an unusual sight along the cafes of Brussels' Grande Place.

Scottish beer has a flavorful past. The first hops to flavor Scottish wort came from Belgium via England. In a land of heather-flavored beer, hops were unpopular at first. Brewers sought to minimize hop flavor to appease customers. More traditional herbs and flavorings included ginger, bog myrtle, orange peel, dandelion roots, juniper, licorice, pepper, spruce, serviceberries, and gooseberries. Early beers were probably made with a mixture of grains such as oats and bere, a precursor and relative to barley. Honey and other sugar sources may have also been used.

Using heather in the boil and hopback, the Scottish brewery MacLay of Alloa makes Froach Heather Ale under contract. The brewery also produces Grozet, a wheat beer flavored with gooseberry and bog myrtle. Most modern Scottish beers, however, have a more conventional ingredients list. Hops balance the sweetness of the beer without contributing much in the nose. Scotch barley is considered to be among the finest in the world. Although unique in character, Scottish pale malt resembles English pale ale malt the closest.

Traditional Scottish breweries drew water from underground sources. Although some no longer have private wells, soft water remains the ideal base for a malty Scotch ale.

The names Scotch ale, wee heavy, and 90 and 120 shilling ale designate beers with original gravities of 1.070 to 1.130. The alcohol content of this beer



may range from 6 percent to 9 percent by volume. The shilling designation historically refers to the price per barrel of beer. The term Scottish ale describes beers of lower gravity between 1.038 and 1.060 that may also be referred to as heavy (80 shilling) or light (60 shilling). An example of Scottish ale is Grant's Scottish Ale with an original gravity of 1.052. The most widely available of the

two designations is Scotch ale, which has higher gravities, 1.085 and above, than Scottish ales. Imported versions include McEwan's Scotch Ale, Traquair House Ale, and the Orkney Brewery's Skullsplitter.

Brewing a Scotch ale can be challenging to the homebrewer. First, the gravity is unusually high. For high-gravity brewing Greg Noonan, one of the authors of *Seven Barrel Brewery*

Brewers' Handbook (G.W. Kent), proposes two mashes. The first runnings from the two separate mashes are used for the Scotch ale. The remaining run-off is collected for a low-gravity beer called two penny.

Alternatively, brewers who have a 10-gallon capacity can simply draw only the first five gallons of wort from the mash. Extract brewers have the advantage that they can keep adding malt extract until they reach the proper gravity. Adjunct sugars may also be helpful in this respect. However, they add little to the style and should be kept below 10 percent of the total extract. All-grain brewers should use British pale ale malt along with light crystal or cara-pils and a small amount of roasted barley. Many American pub brewers of the style like to add peat-smoked malt. Scottish brewers do not partake of this practice. If you've ever had a peat-smoked beer, you can probably guess why. A single infusion mash at 154° F to 158° F will produce the desired fermentability. The beer has an SRM color rating of 10 to 25. It is a deep amber at its darkest. Hops add 25 to 35 IBU and very little aroma. Since they contribute very little aroma, most hop varieties will work.

The flavor should be fairly clean, leaning more toward a lager than a fruity English ale. To accomplish this, use a higher pitch rate than normal. This will reduce yeast growth and therefore yeast byproducts such as esters and fusel alcohols. Like lager brewers, Scottish brewers traditionally ferment their beers cool, 50° to 62° F, and then give them an extended aging period. The yeast strain must be alcohol tolerant and have a low attenuation to leave some residual sweetness. Wyeast 1728 (Scottish ale) and Wyeast 1084 (Irish ale) make nice Scotch ales.

Hop Scotch Ale (5 gallons, all-grain)

Ingredients:

- 14 lbs. pale ale malt
- 1 lb. crystal malt, 10° Lovibond
- 1.3 lbs. cara-pils malt
- 2 oz. roasted barley
- 1.3 oz. Bullion hops (10% alpha acid) for 60 min.
- Wyeast 1728 or other Scottish-style

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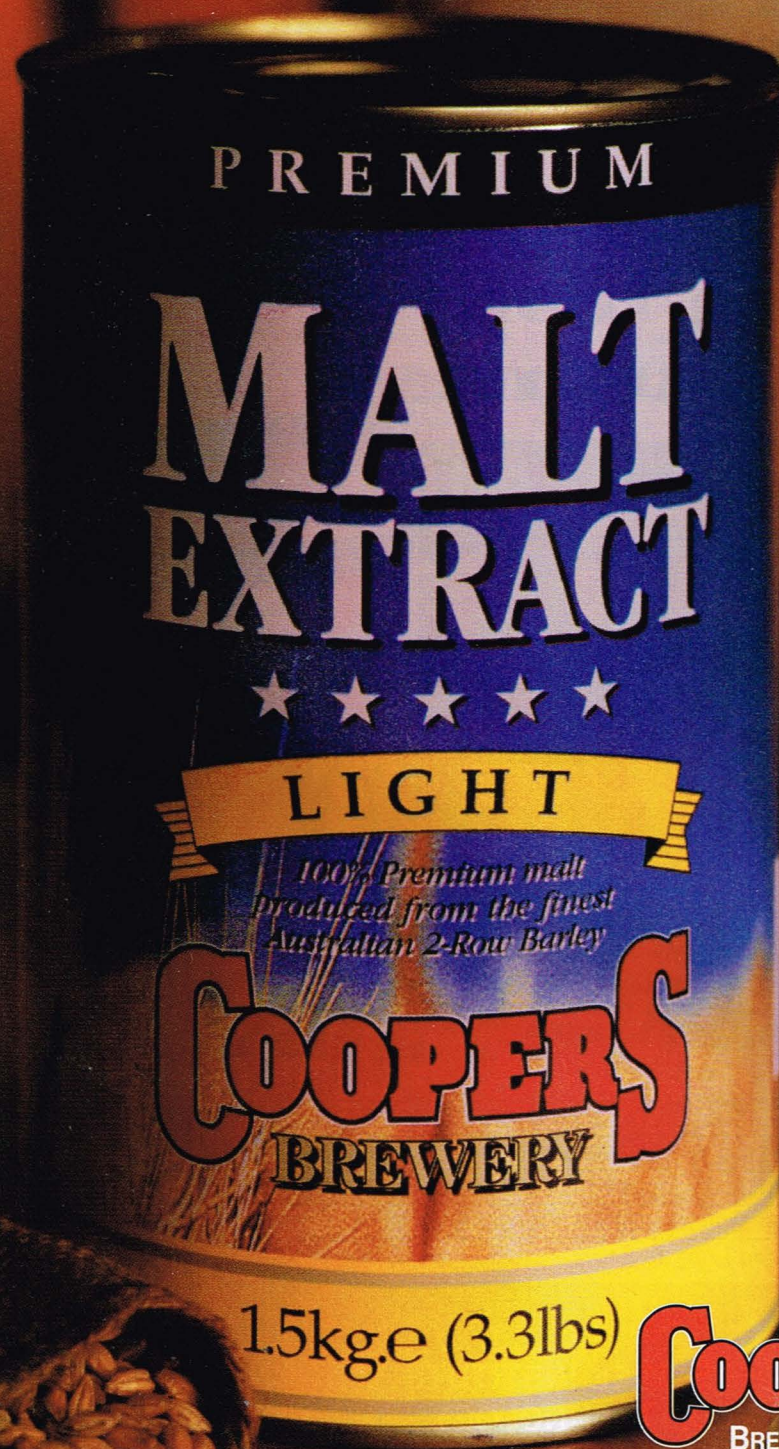
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- ale yeast
- 3/4 cup corn sugar for priming.

Step by Step:

Mash grains in 6 gal. of soft mash water. Heat to 156° F and hold for 60 min. Run off and sparge with 168° F water to collect 6 gal.

Total boil time is 90 min. Boil 30 min. and add hops. Boil 60 min. more. Cool and aerate. Pitch yeast at 55° F.

Ferment at 50° to 60° F until finished. Rack and age at 40° F for three weeks prior to bottling.

OG = 1.088

FG = 1.020

Mel MacGregor's Scotch Ale (5 gallons, extract and grains)

Ingredients:

- 13 lbs. malt extract syrup

- 2.5 lbs. crystal malt, 20° Lovibond
- 1.5 oz. roasted barley
- 0.7 oz. Chinook hops (11% alpha acid) for 60 min.
- Wyeast 1728 or other Scottish-style ale yeast
- 3/4 cup corn sugar for priming

Step by Step:

Steep muslin grain bag loosely filled with crushed grains in 5 gal. of water at 160° F for 15 min. Stir to extract flavor from the grains. Remove bag and squeeze to remove any liquid. Bring water to boil and add malt extract. Stir to dissolve. When boil starts add hops and boil for 60 min. Cool and aerate. Pitch yeast at 55° F.

Ferment at 50° to 60° F until finished. Rack and age at 40° F for three weeks prior to bottling.

OG = 1.088

FG = 1.020

Wee Heavy Weight (5 gallons, grains and extract)

This brew guarantees to be a wee bit more robust than its contemporaries. Such a brew is difficult to purchase but easy to make.

Ingredients:

- 4 lbs. dry malt extract
- 7 lbs. English pale malt
- 0.75 lb. Special B malt
- 1 lb. Munich malt
- 1 lb. crystal malt, 60° Lovibond
- 1 lb. crystal malt, 20° Lovibond
- 0.8 oz. Galena hops (11% alpha acid) for 60 min.
- Wyeast 1728 or other Scottish-style ale yeast
- 3/4 cup corn sugar for priming

Step by Step:

Mash grains in 5.5 gal. of soft mash water. Heat to 156° F and hold for 60 min. Run off and sparge with 168° F water to collect 6 gal.

Dissolve dry malt extract and bring to a boil. Total boil is 90 min. Boil for 30 min. Add hops and boil 60 min. more. Cool and aerate. Pitch yeast at 55° F and ferment at 50° to 60° F until finished. Rack and age at 40° F for three weeks prior to bottling. Prime with corn sugar.

OG = 1.089

FG = 1.030 ■

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Searching for Medieval Ale

by Jeri Westerson

Ale was a staple among the peasant class in medieval days. Today's homebrewer can recreate history with a few basic ingredients and a little imagination.

*Ale, man, ale's the stuff to drink
For fellows whom it hurts to think.*

— Alfred Edward Housman (1859-1936)

What was that tender brew that the early Englishman hoisted to his lips in a chipped ceramic cup or horn? Was it smooth and dark with just a touch of bitterness, or was it harsh and unpleasant because of backward brewing methods?

It is difficult to say. There are few surviving recipes. Brewers in the Middle Ages were as evasive about their brewing secrets as we are today. And of course, literacy being rare then, most recipes were simply handed down verbally through the generations.



But even Charlemagne (742-814 A.D.) concerned himself with his brewers, instructing the court brewmasters just how he preferred his ale, even brewing his own. This concern for one's brew preference was a tradition reaching as far back as the Pharaohs of Egypt. Manathos, an Egyptian Greek and high priest of Heliopolis in times before Christ, wrote of Egyptian ale and of how Osiris, god of the underworld, invented it thousands of years before.

In 1256 breweries were built in the kingdom of Bohemia under the direction of King Ottokar II at a town called Budweis. (Sound familiar?)

In 1268 King Louis IX of France issued laws concerning brewing:

"Beer yeast brought by foreigners shall be inspected by a jury before it is exposed.

"No brewer shall keep in, or about, his brew-house any cows, oxen, hogs, geese, ducks, or poultry, as being inconsistent with cleanliness.

"A widow may employ servants in brewing, but may not take an apprentice.

"Master brewers shall not entice away another's apprentices nor servants."

In 1542 the writer Andrew Broode made the distinction between "ale" and "beer," defining it in his Dyetary; ale is made of water and malt, while beer is made of water, malt, and hops. As early as the 13th century, hops were used throughout Europe to bitter and help preserve fermented malt beverages, but England seemed reluctant to drop all production of ale, especially the poorer folk of England. It wasn't until much later in the 18th century that most English brewers produced bitter, hopped beer for which they

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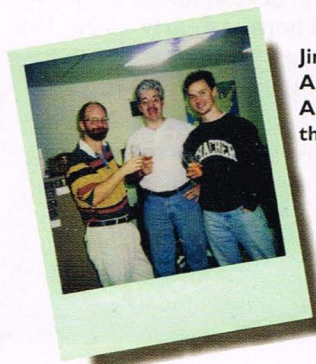
Making great beer doesn't have to be as difficult as putting a man on the moon. You decide how much time and effort you want to spend on your homebrew. And whether you brew an easy-as-1-2-3 pale ale or experiment with a Dark Side of the Moon Stout that you plan to enter in one of our hundreds of sanctioned homebrew competitions nationwide, the American Homebrewers Association® (AHA) is your Ground Control. We're there to help

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Jim, Brian and Amahl: our AHA "guys in the lab."

How to Avoid Alien Encounters

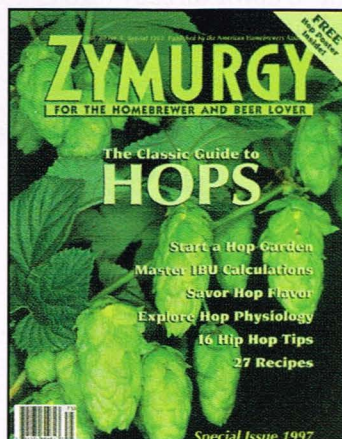


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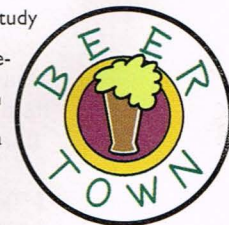
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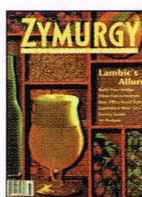
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have since become well known.

The average town in the Middle Ages (a period roughly estimated as 500 to 1500 A.D.) boasted of its own small brewery run by an ale wife or brewster, one of the few opportunities in that era for women to excel in the marketplace. Ale houses were places not only for relaxation and a thirst-quenching libation but for the more important conducting of legal business. "Alehouse testimony" — an oath made publicly under its roof — was as binding as an oath declared in a court of law. The transferring of chattel (including the disposition of one's wife or husband) could be made legal if declared under alehouse testimony.

As the medieval years progressed, more and more of the brewing business was taken over by the monasteries, where labor was plentiful and the finances of a wealthy patron made it a profitable enterprise for the monks. After a time most of the large-scale brewing was undertaken by the monasteries, whose monks perfected many brewing innovations.

"Church Ale" was the monks' way to raise money for church buildings. It created a less painful (or at least anaesthetized) way to motivate charity.

Spelt and Mugwort

The taste of the ale was determined by the local ingredients. Unless an adequate substitute for hops was used, most ale of the Middle Ages might have been quite sweet (depending on how much roasting the malt got), and certainly some sweeter ale was consumed. Also, without the preservative effects of hops, quick spoilage was an inevitability, so consumption was great; they drank the ale or beer almost as fast as they made it. Monastery documents record that each monk consumed his portion (an entire jug) at each meal!

Ale was a staple of the peasant class, wine being far too expensive with its time-consuming process. Water was certainly the drink of choice for those in the poorest classes. Goat or cows' milk was a commodity better used for butter and cheese production. Drinking fruit juice was a waste of rare sugars needed to spruce up dull ingredients in other foods, especially as winter wore on. Honey was another sweetener, and mead, or honey wine, was enjoyed on many feast days and celebrations.

In England tradition tells us that ale was introduced by the Romans and improved by the invading Saxons. Ale ingredients were varied and plentiful;

oats, barley, rye, and spelt or wheat were the stuff of a peasant's daily life. Flavorings included those herbs that could be found in the countryside or cultivated in the English garden: rosemary, fennel, thyme, rose hips, yarrow, parsley, sage, hyssop, savory, chamomile, purslane, and mint, to name but a few. Spices such as cinnamon, cloves, cubeb, nutmeg, and ginger were also added to spike the flavors and give interest to common fare. To bitter the sweet beer, juniper, mugwort, wormwood, or tansy might be added.

When flowers and other leafy herbs or fruits were added to the brew it almost certainly provided necessary yeasts; for yeast, as such, was not an ingredient of itself. The people of the Middle Ages knew that yeast was necessary but didn't quite understand where it came from. The barm (yeast froth) was scraped off the top of the fermenting beer, saved and used to make bread or promote the next batch of brew.

Ale, the Old-fashioned Way

A simple medieval-type recipe may be approached by an intrepid brewer. Perhaps a friend playing a tune on a reed or banging a tabor in the background might elevate the spirits to the proper mood.

Obtain unmalted grain from any local feed supplier, making certain to get whole grain, not rolled. These come in 50-pound bags, providing multiple opportunities to improve the recipe. Soak 15 to 20 pounds of grain for 30 hours in cool, hard water (like the waters of Burton-on-Trent, England, famous for its brewing waters since the 13th century). Drain and change the water every eight hours until grains plump. Strain off the grain and allow it to sprout by laying out grains on mats, stirring often for five days so that the grain won't rot. (An unpleasant aroma will develop, much like a wet barnyard. Don't let this alarm you; merely enjoy the "earthy" experience.) Put the grain into clean pillow cases, tied tightly, and dry in the clothes dryer on low heat.

When the grain is sufficiently dry, it's a good idea to roast it. Divide the grain into quarters and roast one part

Barm Bread

Ingredients:

- 1/2 cup warm water
- 1 1/2 cups of barm (kraeusen), room temperature
- 5 Tbsp. honey
- 2 tsp. salt
- 1 egg, lightly beaten
- 5-6 cups unbleached flour
- 2 Tbsp. milk

Step by Step:

Combine first five ingredients in a large bowl. Add 2 cups of flour, incorporating fully with a wooden spoon. Add 2 more cups until batter forms a dough. Turn out into a kimmel or kneading trough (or onto a well-floured surface) and knead, adding more flour until the dough is

only slightly sticky. Don't allow it to get too dry. Knead until dough is smooth and elastic.

Place dough into greased bowl and cover with a damp cloth. Leave in a warm, draft-free place for an hour or until doubled in size. Punch down dough with your fist. Turn out onto floured surface and roll out all the bubbles with a rolling pin.

Divide dough into two to four portions and shape into round loaves. Place on a greased cookie sheet. Slash the top of the loaves with a cross or cross-hatch (tic-tac-toe) pattern. Let rise a second time for 20 min. Brush tops with milk and bake in an oven preheated to 400° F for 21 min.

at 225° F for 15 minutes, the next for 30 minutes, the third for 30 minutes at 250° F, and the last part for 30 minutes at 300° F. This roasting method may approximate what could be achieved in a large kiln.

How long it is roasted will determine how much sugar and flavor you extract. Experiment. (Two to three

pounds of two-row malt can be used to ensure full starch conversion.) Then grind. A mill stone would be best, but a standard grain mill will do.

Put the grain in a kettle and add hot water (170° to 180° F) at a ratio of one quart per pound of grain, and steep at 155° F one to two hours. Temperature in the Middle Ages was derived from adding cool water to hot in known quantities with familiar containers, possibly the same containers used for generations. One simply grew accustomed to how many piggins of cool water were added to the boiling vat to know the exact temperature desired. You, however, may use a thermometer.

Drain sweet liquid from the grain and rinse the grain with hot water. Each pound of grain should yield 1.5 to 2.5 quarts of liquid. Boil again for 60 to 90 minutes. Add flavorings — herbs and spices — at this time if you desire.

Transfer to a wooden barrel and leave to cool to about 65° to 70° F. The wooden barrels would almost certainly

have provided all sorts of yeasts, but to secure fermentation for your batch, add your own brewer's or bread yeast at this time and leave it to ferment in a cool place where the temperature will not vary greatly. Skim and save the barm (kraeusen that rises to the top of the fermentation) for bread-making for that extra touch for your medieval dinner. (See Barm Bread, page 26). Cover with a light cloth. Allow the ale to stand for an extra day or two after fermentation stops to let the yeast flocculate (settle to the bottom of the container).

Consume the ale within a few days because it contains no preserving elements other than alcohol. It is best served in a ceramic or wooden mug, silver goblet, prepared horn, or a humpen, the community stone mugs used by early Saxons. Enjoy with a mutton joint or roasted swine along with that bread you baked with the barm. Don't forget the goat cheese and a well-deserved toast to those brethren of yesterday who toiled daily to brew for king, country, and posterity. ■

More Beer History

Beer, It's History and It's Economic Value as a National Beverage, Frederick William Salem, 1880.

Encyclopedia of Beer, Christine T. Rhodes, Henry Holt and Co., 1995.

A History of Brewing, H.S. Corran, 1975.

A History of English Ale and Beer, A.H. Monckton, 1966.

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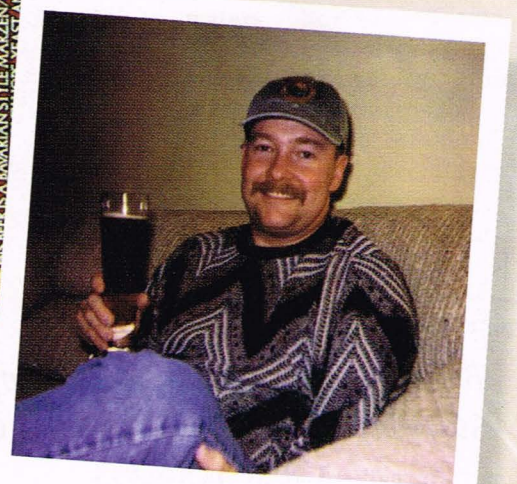
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My Week



Bottling his favorite beer was a highlight for Gordon Power, homebrewer and apprentice for a week.



as a Pro Brewer

by Gordon Power

For the last few years my buddies and I have been making the trek from the Chicago area to Sturgis, S.D., for the Sturgis motorcycle rally. For the uninitiated, the rally attracts thousands of bikers from around the world. It is one of the largest assemblies of Harley-Davidsons and an awesome display of old, new, and custom hardware.

One of the nicest rides in the area is scenic Spearfish Canyon leading to the town of Deadwood. Rich in Wild West history, Deadwood is the site of Wild Bill Hickok's shooting and was renowned during the gold rush days. Today it remains a picturesque historic town with plenty of casinos,

bars, and restaurants, all set in the scenic Black Hills.

Last year we happened to stumble upon a prize find, a small microbrewery called The Black Hills Brewing Co. in the middle of town. The name has been a part of the Black Hills history for more than 115 years. Originally located in Central City, just up the road from Deadwood, the brewery produced the renowned Gold Nugget Beer label for more than 40 years. The company was a booming success until Prohibition forced the brewery to close down.

The Black Hills Brewing Co. has been an integral part of the region's colorful frontier history and was the

largest and most prominent brewery in the Northern Black Hills region. The new Black Hills Brewing Co. chose the name to keep with a strong local tradition. Karl and Rose Emanuel and Tom and Laura Damon incorporated the present-day Black Hills Brewing Co. in January 1993. Karl's family is from Germany, where for centuries their livelihood was brewing German beers. Many of the recipes used in the production of Black Hills beer are the original recipes that were used by Karl's family. This is some serious beer here, and I was blown away by the attention to detail and the quality.

I had toyed with the idea of homebrewing for a number of years. Talking to Karl finally pushed me over the edge. I hit the ground running as soon as I got back home. I tracked down the nearest homebrew store and purchased a starter kit. I haven't looked back since.

Okay, who am I trying to kid? Brewing has become what borders on an obsession. To make a long story short, after buying all kinds of equipment and reading every book, magazine article, and Internet file I could get my hands on, I brewed a number of batches. A few were wonderful successes, a few were decent, and a few were drain cleaner. The bottom line, however, was that I was making progress and getting more confident and consistent with each batch.

That's when The Idea hit me. Why not see if Karl would take me on for a week? Made perfect sense to me. As long as I was making the trek anyway, why not apprentice at the source? My beer Mecca, as it were. My sales pitch was quite simple. They get free labor; I get a free education and a taste of how the pros do it. I was an extract brewer looking to get into all-grain, and all Karl and Tom would have to do was put up with my incessant questions. After a letter and a phone call, Karl agreed to let me come on board for the week and help out.

The Brewery

The brewery itself is, from a production standpoint, relatively small; the brewhouse is 7.5 barrels and brews 15-barrel batches. They have a very nice looking facility crafted from

California redwood with a store/display area, a brewing room, walk-in cooler, gravity-fed sparge/hot water room, and a bottling/production room. My facility consists of the kitchen and a refrigerator in the garage. I was quite struck with the usability of the rooms. Sinks everywhere, epoxy coated, sloped floors with drains, hooks and racks for everything, and enough room to maneuver in to make the brewing and cleaning processes easier. And stainless steel everywhere! Hose fittings, clamps, pumps, and braided hose lines. Little plastic tubes and tubing I was used to were now replaced with large-diameter hoses with stainless clamps, fittings, and valves.

The concept of clean-in-place (CIP) was a breath of fresh air. Being able to clean gear by running cleaner and sanitizer through it without breaking it down is the hot setup. Then again, these guys don't have to take their brewery apart at the end of the brew day to turn it back into a kitchen like I do.

Brewery Labor

We got started at nine in the morning the first day. Karl gave me the quick walk-through, and then I stood knee deep in grain to brew my first micro. The beer coming out today: a fine kölsch. What a rush to be dealing with 50-pound sacks of grain (and having to use a hand truck to move them around) rather than the small bags I was used to. Dumping the big bags of Vienna, wheat, and barley malt into the kettle, we were off to the beginning of a long brew day.

Karl uses a step infusion mash to extract the subtle flavors from his malts and is a stickler for minute details. Each step of the way he explained himself in sometimes excruciating detail, much of which is just now (a few months later) starting to make sense. It was a little overwhelming at times. Much like brewing at home, the process involves prepping the gear, much waiting, and anticipating the next step.

By early afternoon we were transferring the grain to the lautertun and sparging wonderful pale wort back to the boiling kettle. Raising a huge kettle to boiling temperatures takes a lot

longer than my little eight-gallon pot. But if you enjoy the smell of boiling wort as much as I do, nothing can prepare you for the smells rolling out of the big kettle.

The boil was finished by early evening, and it was time to pump the boiling wort through a plate heat exchanger. Hot wort and cold water in, cold wort and hot water back out. It made my immersion chiller look downright primitive. Off to the fermenting tanks, pitch a starter batch, and it's the end of a long day.

Day two started off with a final cleaning of anything that hadn't been taken care of the night before and then to the bottling room to start bottling the brewery's flagship beer, Deadwood Territorial Red Lager. It is the brewery's most popular (and my favorite) production beer and is a terrific deep red lager with a nicely balanced malt flavor.

The bottling for the day involved moving cases of 22-ounce bottles from the storage area to the bottling room and filling, capping, and labeling them. Everything was done by hand, much like a home setup, but using a high-tech counterpressure bottle filler/capper allows a higher volume of bottles. Although the process is very labor intensive, with a lot of teamwork these guys can crank out an amazing amount of product (500 barrels last year with a projection of 1,000 barrels for this year).

Lessons Learned

Amidst all this fascinating equipment, did I actually learn anything? Here's a list of things I can apply to my home setup:

1. Cleaning/sanitizing is everything. Nothing new here, but it is worth repeating anyway.

2. Brewing at the pro level is as much or more of a tinkering/troubleshooting process as the home version. If the gear doesn't exist or is too expensive, make an alternative. A little creativity goes a long way.

3. The yeast pitching rate is monstrous compared to the homebrew rate. I have used smack packs for the entire time I have been brewing and lately have used starter batches. After seeing the amount of yeast slurry that

goes into a big batch, I have to wonder if it would even be possible to over-pitch a home batch.

4. I was taken aback by the fact that the grains and yeast we use are the same stuff that breweries use. The only difference is the quantities. I will never be able to use the excuse that I don't have access to the raw materials the big guys use. This pertains to yeast, grain, and hops. We just pay more per ounce because we use smaller quantities.

5. Brewing at the production level is damn hard work. Somehow when you deal with five-gallon batches it never occurs to you that getting rid of spent materials in the brewhouse takes shovels and weighs hundreds of pounds.

6. Keep a tray or bucket of iodophor or other no-rinse sanitizer handy at all phases of brewing. I have always sanitized my equipment and left it at that. It's nice to be able to toss a dropped part into a bucket of sanitizer. If you have any doubts about any of your equipment, it's a great idea to keep a strong solution of sanitizer in a spray bottle for instant application. You can avoid contaminating your beer with the high concentration by rinsing with the no-rinse concentration. Instant kill, then rinse.

7. Yes, the smell coming off of a big brew kettle is as overwhelming as you might imagine. It permeates your clothing. It's wonderful. For the record, weighing hops by the pound is too cool to describe.

8. Record keeping of the brewing process is one of the only ways to achieve consistent brewing. Karl keeps immaculate records of the process from start to finish.

9. We all know that being able to control the temperature of the beer at all stages is one of the keys to a successful beer. There are more techniques available than just refrigeration. Karl and Tom employ a chiller coil in some of their fermenters and can maintain fermentation temperatures without using glycol or active refrigeration for ales. It might be interesting to come up with a home version that could be made from small-diameter copper tubing and could be twisted into the mouth of a carboy.

10. Above all else, attitude is everything. No matter what gear, no matter what experience level, you should be enjoying yourself. It takes as much dedication at the homebrew level as it does at the professional level if you are doing it right.

All in all the trip was the ultimate homebrewer's vacation. A very big thanks to Karl and Tom, who were fabulous to work for and are the

consummate homebrewers. I am now a firm believer that the brewing process is comprised of about 60 percent inspiration and about 40 percent perspiration.

By the way, right now I am sipping a very pretty pale ale that I started the day after I got home. It is by far my best brew ever. A passing of the baton? Isn't that what this art form is based on? 

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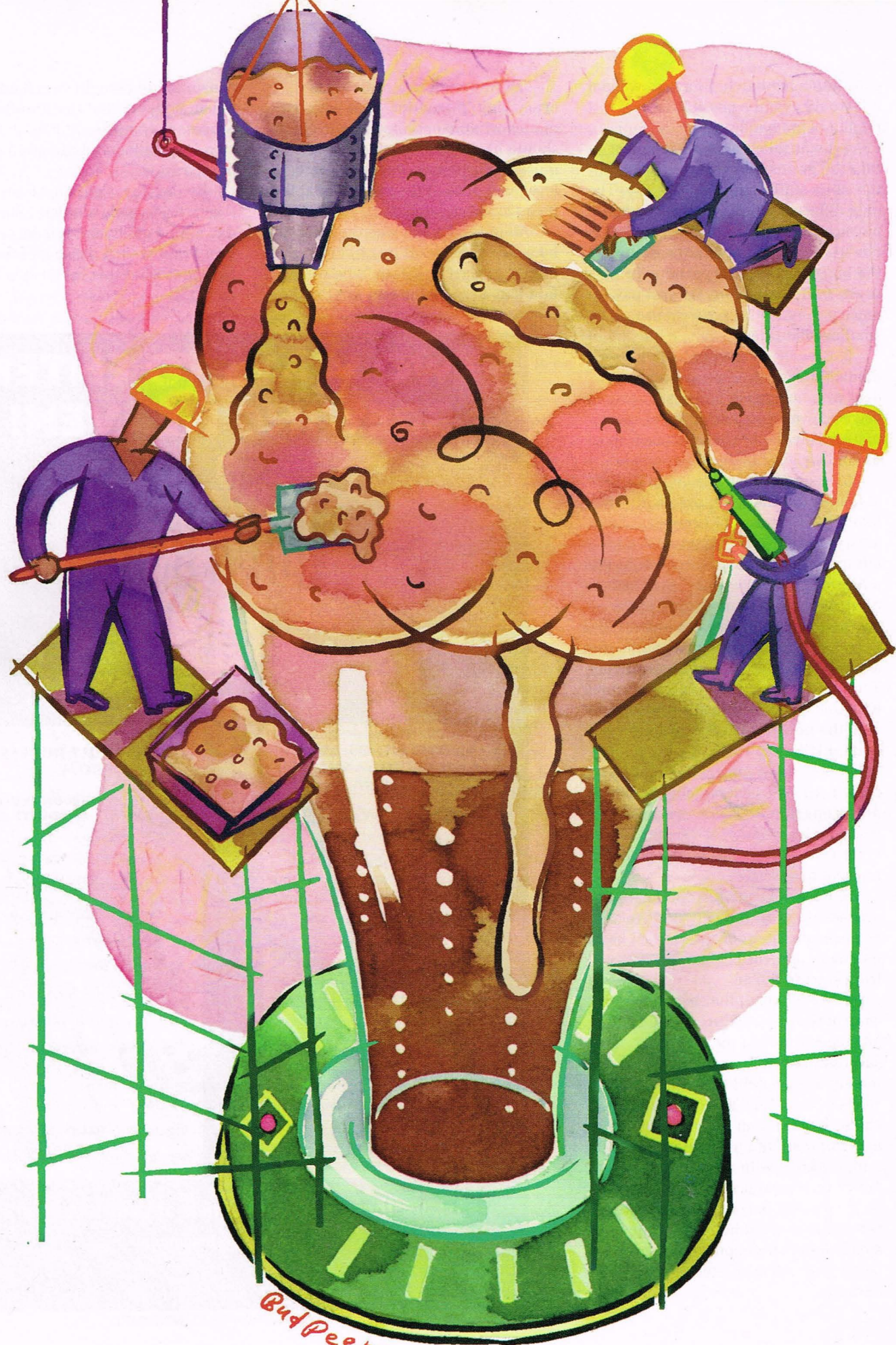
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Fabulous Foam!

Pop it open. Pour. Fizz. Oh, what a relief it is. That is to have a beer with a frothy head, of course. As homebrewers we like to consider ourselves beer scholars who see beyond appearances and judge beverages on nuances of flavor. It's time to burst the bubble; the reality is that homebrewers are rather shallow in this regard. We love the looks of a creamy head on a Guinness stout or the Brussels lace left on a glass of Chimay. Why else would marketing-savvy magazine publishers include tempting pictorials of beers topped with prodigious mountains of foam? They know what we like. Naturally, we also want to

produce a good-looking homebrew to impress our friends and family. Understanding what affects beer foam can help you hold your head up high in situations where others fall flat.

Beer foam has a short, tragic existence. It is born, lives, and dies. Like many obsessed homebrewers, its life revolves around beer. The formation of beer head depends largely, but not exclusively, on carbonation, the amount of dissolved carbon dioxide gas (CO₂) in beer.

Beer can be carbonated naturally by fermentation in a closed container or by forced carbonation. Gas in an unopened bottle of beer is in

by Alex Fodor

equilibrium. This means that at any given temperature, the gas pressure in the headspace and the amount of gas dissolved in the beer are constant. When you open a bottle of beer, you create an imbalance between the amount of CO₂ in the beer and the amount of CO₂ in the atmosphere above the beer. The amount of CO₂ in the air is only about 0.2 percent of the total atmosphere, compared with 98 percent in a beer headspace. To restore equilibrium, the CO₂ bubbles will leave the beer until balance is restored. That is why an open beer will always go flat over time. Of course agitation and warm temperatures will hasten this process. This phenomenon is demonstrated by opening a thoroughly shaken beer or pouring beer from an over-pressurized or warm keg of beer.

Head Hunting

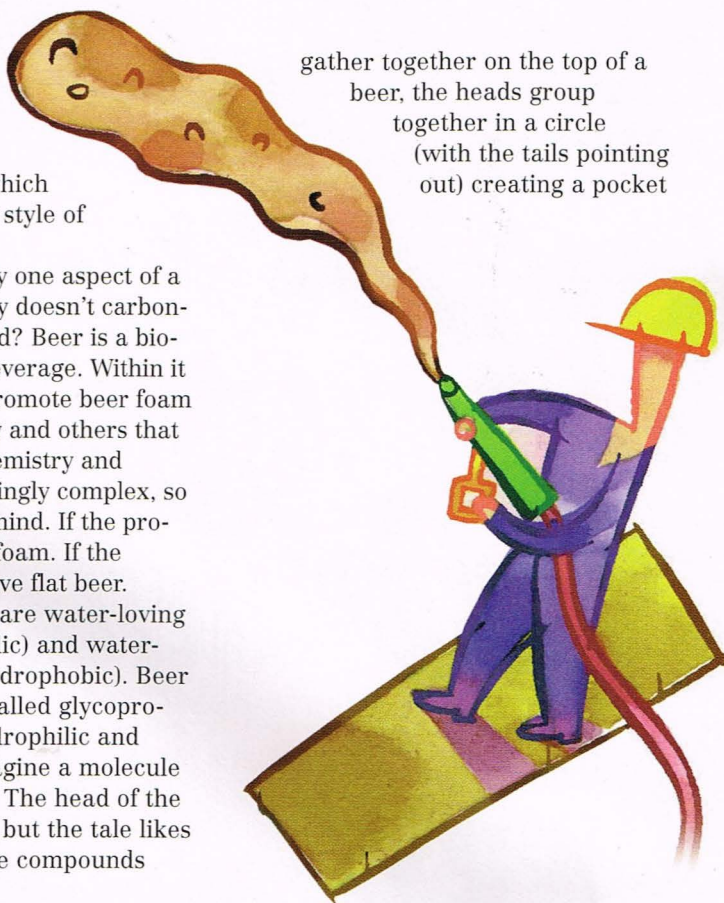
As a homebrewer, fine tuning carbonation will ensure a good, consistent head. Undercarbonated beer will not form a head, which, in the case of a

draft pale ale, may be desirable. If the beer is very overcarbonated, it is more likely to gush, which isn't desirable for any style of beer.

Carbonation is only one aspect of a good, frothy head. Why doesn't carbonated water have a head? Beer is a biochemically complex beverage. Within it are compounds that promote beer foam formation and stability and others that detract. Beer foam chemistry and physics can be disturbingly complex, so keep the following in mind. If the promoters win, you have foam. If the detractors win, you have flat beer.

Within beer there are water-loving compounds (hydrophilic) and water-hating compounds (hydrophobic). Beer also has compounds called glycoproteins that are part hydrophilic and part hydrophobic. Imagine a molecule shaped like a tadpole. The head of the molecule hates water, but the tail likes it. When many of these compounds

gather together on the top of a beer, the heads group together in a circle (with the tails pointing out) creating a pocket



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of CO₂, naturally forming bubbles.

Many compounds including iso-alpha-acids from hops and certain metal ions help stabilize these structures. However, fats and detergents tend to destabilize the bubbles and cause the foam to collapse. This is why adjuncts that are high in fat including oats and eclectic brewing spices with high oil contents such as coffee beans tend to decrease foam. Also residual soap and detergents in carboys, kegs, and bottles will hurt beer foam. Settling out trub will decrease the amount of fatty acids in the beer. In contrast ingredients that are high in protein and glycoproteins will bolster beer froth. Some of the more common foam-positive ingredients include flaked wheat, flaked barley, wheat malt, and barley malt. Many brewers make a habit of adding a touch of wheat malt to every beer. At low levels the impact on flavor will be small while still imparting foam-positive characteristics.

Mash ingredients that are low in protein such as corn, rice, and sugar adjuncts tend to dilute foam-positive compounds in beer. Malt extracts may lose foam-positive characteristics during processing. The addition of heading powder can counter this problem. Some professional brewers use this additive, an alginate ester, to increase head formation and retention.

Keeping Your Head

Forming a good head is important, but so is keeping it there. This is known as head retention. One of the most important parts of maintaining foam is beer viscosity. Viscosity describes the speed of flow of a liquid. For example maple syrup pours slowly, so we consider it a very viscous liquid. Beers also have different viscosities.

Imagine beer foam as a matrix of bubbles in a liquid. The liquid drains down from the bubbles and back into the beer. Without any liquid surrounding them the bubbles pop and the foam collapses. In a beer with high viscosity, the liquid between the bubbles drains away slowly, so the head lasts longer.

Raw or flaked barley adjunct increases beer viscosity. Some homebrewers occasionally add a pound or two of flaked barley to pale ale type beers and Irish stouts. Beyond

increasing head retention, the barley fills out the body of the beer.

Body of Evidence

The final attribute of good foam is the manner in which it clings to the glass. This is aptly referred to as foam cling. Even after the foam has fallen and the beer is finished, the sight of a sudsy latticework on the side of the glass is a fond reminder of a satisfying

beer. The iso-alpha acid of hops is said to increase foam cling as are foam-positive compounds in general. However, foam cling may be largely due to the cleanliness of the glass. Foam tends to stick to slightly dirty parts of the glass as it descends. This must be a subtle effect, since a very dirty glass or any soap residue will completely collapse the foam.

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CIRCLE 24 ON READER SERVICE CARD

Strategies in the Foam Game

Awesome Foam — for the brewer in search of drop-dead head

- Brew all-malt beer (no adjuncts such as rice, corn, or sugar); made from all-grain brewing.
- Use foam-building ingredients such as wheat or unmalted barley.
- Carbonate to a slightly higher level or use a nitrogen stout gas.
- Use scrupulously clean glassware.
- Leave no chemical residue on any brewing equipment, beer bottles, beer glasses, or body parts. Foam suffers from the thought of some chemicals.
- Brew hefe-weizen, wit beer, and stout (dispensed through a stout tap). These three styles have naturally awesome foam.

Good Foam — for the brewer who

wants a good head without jumping through hoops

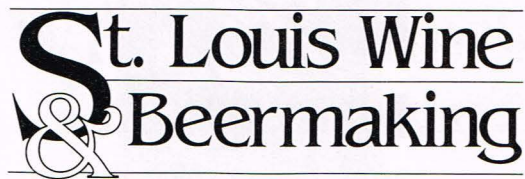
- Brew all-malt beer (no adjuncts such as rice, corn, or sugar) made from all-grain brewing. Extracts lose much of the foam-building proteins during processing.
- Use a generous addition of hops. Hop bittering acids help foam cling.
- Properly carbonate so the foam has enough gas to form correctly.
- Thoroughly rinse your equipment but don't obsess — no-rinse sanitizers are acceptable for the brewer in search of good foam.

Bad Foam — some of the most common culprits to avoid

- Excessive use of adjunct ingredients. Ever see an American-style lager with awesome foam?
- Very, very little hops. Light

beers with low hopping rates have bad foam!

- Fats and oils — oats, coffee, chocolate, potato chips, and the like all contain fats and oils. Avoid the use of such ingredients if you want good foam. If you want chocolate porter more than foam, then don't worry — you may get lucky and have good foam.
- Foaming cleaners and sanitizers. Detergents destroy beer foam even though they are foamy themselves. These compounds must be rinsed off of all brewing equipment.
- Foaming the beer before drinking. Once a foam forms, the foaming compounds do not form foam a second time.
- Flat beer doesn't foam unless it is dispensed using special taps (beer engines for example).



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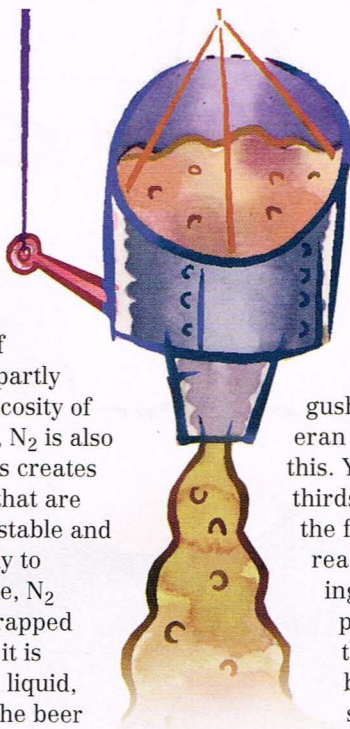
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are served with a nitrogen (N_2) and carbon dioxide mixture. These beers have a very thick, beady head that seems to last forever. In the case of Irish stout, this is partly due to the high viscosity of the beer. However, N_2 is also responsible. N_2 gas creates very fine bubbles that are structurally more stable and therefore less likely to burst. Furthermore, N_2 gas is somewhat trapped in the foam. Since it is not very soluble in liquid, N_2 tends to leave the beer and go directly into the foam. However, keep in mind the idea of equilibrium. The atmosphere is 75 percent N_2 as opposed to 0.2 percent CO_2 , so the N_2 gas in the



beer foam is not escaping to the atmosphere at any great speed. Consequently, a nitrogen foam is happiest just sitting on top of the beer. To the beer drinker's delight, this effect is aesthetically pleasing.

Over Your Head

A problem sometimes encountered with beer head is gushing or jumping beer. Most veteran homebrewers have experienced this. You crack open a brew and two-thirds of the beer is all over you and the floor before you manage to reach the sink. Most cases of gushing homebrew are due to over-priming or microbial spoilage in the bottle. Avoid these problems by carefully measuring priming sugar and practicing good sanitation. Technically, malt made from *Fusarium* (mold) infested barley makes beer that gushes. However, most malt now available shouldn't cause gushing.

Remember the following tips when trying to brew a beer with good head:

- Get your carbonation right.
- Bittering hops are head builders.
- Wheat malt is a natural head booster.
- A small addition of flaked barley will increase head retention.
- Heading compound can increase beer foam.

- Settle out trub.
- Sanitize and rinse well.
- Beware of fats and oils.
- Avoid diluting protein with low-protein adjuncts (corn, rice, sugar).

A nice, frothy head is not just the responsibility of the brewer. The way a beer is poured and the cleanliness of the glassware are just as important. Also, keep in mind that the way a beer looks is never as important as how it tastes. Not every beer you make will look glamorous. Most important is how you like it. If you want to add greasy coffee beans or Fruity Pebbles to the mash and you are happy with headless beer, then more power to you.

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WINNING THE

Air Wars



L

et's call it the "air issue." It encompasses the question of aeration and oxidation in beer. And let's pardon the obvious tendency to pun, and clear the air of the air issue from the start. There are two simple rules that will govern the air issue. Period. Here they are:

Rule No. 1: Air is bad for beer. Bad, bad, bad! Beer does not need to have anything to do with air, ever.

Rule No. 2: Air is generally bad for wort, except in the presence of yeast. The only time you should consciously add air in the brewing process is at yeast-pitching time.

BY NICO FRECCIA

That's it. Keep those two rules in mind, and you'll never have to worry about the air issue again.

Now why do we need to make such simple proclamations about air in beer? Despite sometimes confusing and seemingly contradictory instructions, the air issue is an easy one to understand and use. The reason the air issue might sometimes seem confusing is that air is often discussed as a secondary issue.

For example a discussion of bottling might caution you to avoid splashing so as not to aerate the beer. Another discussion about mashing might warn you not to agitate the mash too much for fear of introducing air. And a discussion of fermentation will implore you to splash the wort, shake the wort, and generally use any means necessary to get air into the beer. What gives?

The air issue needs to be addressed as a single issue with the entire brewing process in mind and not just the individual steps. When





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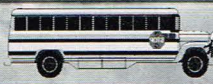
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taken in this light, the air issue is quite simple to understand. And always remember the two rules stated above.

Avoid Wet-Paper Beer

Oxidation is the reason brewers worry about the air issue. Oxidation is a common beer off-flavor perceived both in the aroma and flavor. Oxidation is most commonly perceived as flavor and aroma that is stale, cardboardy, or like wet paper. It can also, particularly in stronger, aged beers, be perceived as sherry-like or winey, having flavors of brandy, prunes, sour wine, or over-ripe fruit, and sometimes like old, stale vegetables. Oxidation can also cause the beer to darken and become hazy.

Oxidation occurs when air is introduced during the brewing process. But all brewers can naturally combat oxidation because they have a secret weapon.

Yeast, during its early growth stages in a nutrient-rich wort, is an air scavenger that will use up all of the air that is available in the solution. It not only loves air at this stage, it needs it. So it's okay to introduce air at the yeast-pitching stage because we know that a) the yeast needs it, and b) the yeast will remove all of it from the wort during the yeast's growth process.

The oxidation reaction occurs in finished beer most often during racking after primary fermentation and during bottle filling. These are the times to be most careful in avoiding unnecessary splashing of the beer. Oxygen, if introduced at this stage, will chemically react with beer flavor compounds, causing the beer to grow stale. Heat and warm storage of the finished beer will accelerate the oxidation process.

The other key stage in the brewing process where oxidation can occur and be carried into the finished beer is during the mash and sparge. This is referred to as "hot-side aeration."

The Hot Zone

Hot-side aeration describes the pick-up of air during the "hot" stages of the brewing process. However, it is really only a concern during the mash and sparging stages. During the mash and sparge, there are certain enzymes

present in the malt that, when in the presence of oxygen, can combine with malt compounds and form the flavor and aroma compounds that we perceive as oxidation. Therefore, taking care not to splash the wort too much during mashing, sparging, and runoff into the kettle will help you avoid these flavor and aroma compounds. As soon as you begin the boil, the enzymes will be destroyed, and the risk of oxidation

at this point is then eliminated. So don't worry about stirring and splashing during the boil. Boiling will drive any remaining oxygen out of the wort, and many large commercial breweries actually aerate the wort during or immediately after boiling to help precipitate tannins and to strip unwanted volatile gasses from the wort.

But remember, because boiling strips the wort of oxygen, it is even

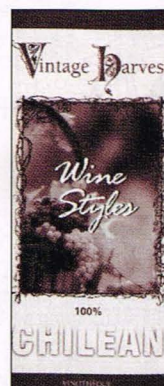
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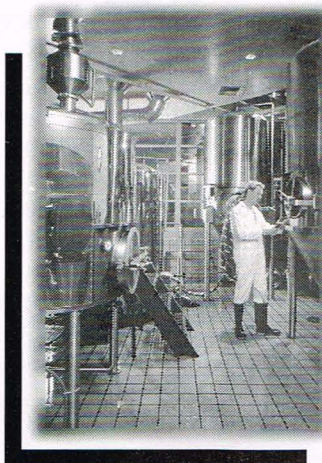
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more important to aerate the wort when you pitch the yeast.

Oxygen for Yeast

Aeration is the process of getting oxygen into the wort at yeast-pitching time, the only time during the brewing process that you should consciously be introducing air. It is imperative that yeast have oxygen available at this stage for energy buildup and growth.

There are numerous methods for getting air into the wort at this stage. The easiest and most common is to splash the cooled wort as it enters the fermenter. (Do not start splashing until after the wort is cool.) Running the wort down the side of the fermenter is a standard method, but simply attaching a device such as the bent pocket clip from a ballpoint pen to the end of the racking hose works even better. The wort hits the clip and sprays out into the fermenter. The other most common method is shaking the fermenter for several minutes. The combination of splashing and shaking should be adequate to get enough oxygen dissolved into the wort. As with all practices at this stage, be very careful about sanitizing your equipment and avoiding contamination.

If you are brewing a higher-gravity beer, bear in mind that higher-gravity worts cannot hold as much O₂ in solution and therefore they should be particularly well aerated.

One of the easiest and most effective methods for aerating all types of wort is to buy or build a wort aerator. Many homebrew shops and mail-order companies sell regulators for mini oxygen tanks and small aerating stones for about \$15 to \$20 each. You can buy small tanks of pure oxygen at your local Home Depot for \$5 to \$7. Since no bacteria can live in pure oxygen, you will need only sanitize the regulator, hose, and air stone. A 30-second blast from one of these systems will do the trick handily. Liquid Bread of Orlando, Fla., makes a complete pure oxygen system called the Oxynater for about \$50. You can also make your own airstone system by buying an aquarium aerator with aerating stone and some tubing. Because you will be pumping in room air, you should also add an in-line 0.2- to 0.5-micron

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syringe-type filter to catch any bugs.

Both shaking and splashing vigorously and oxygenating with pure O₂ should give homebrewers the desired results. Studies have shown that excessive wort oxygenation is difficult to achieve even with pure oxygen and that worts will reach a maximum oxygen saturation level, after which more O₂ just won't dissolve. So don't worry about too much O₂; worry about not getting enough in.

Perhaps just as important as proper aeration at pitching are proper brewing techniques to avoid aerating during the brew. If you are an all-grainer, stir your mash gently, and quietly run the wort off into the kettle without splashing. All brewers, whether all-grain, partial mash, or extract, need to be very careful when racking and bottling. Always use a siphon, and employ a hose long enough to reach to the bottom of the receiving bucket, so that wort is not splashing or running down the sides of the bucket. Also, regulate the flow of beer during racking to avoid splashing.

During bottling, use a bottle filler or hose that reaches to the bottom of the bottles and fill from the bottom up. Most homebrewers bottle condition their beers. Because you will be adding new fermentable sugar to the beer, the yeast will respond as if they are in a new wort and begin their growth phase all over again (hence the sediment in the bottom of the bottle). This means that the yeast, as during primary fermentation, will use up all of the air in the bottle. Bottle conditioned beer, then, is a good hedge against oxidation, but it's no excuse for not following careful racking and filling procedures.

The Big Picture

The concepts of aeration in brewing vs. oxidation in brewing are really quite simple. Follow the two rules outlined, and look at the air issue over the course of the whole brew to better understand it.

Remember to keep air pick-up to a minimum during mash and sparge. Boiling will drive out any air remaining in the wort. Then, once the wort is cooled, it needs to be aerated

for the benefit of the yeast. Don't bother trying to aerate hot wort. Hot wort cannot hold enough air in solution to really do any good. The yeast will use up all of the air, and as fermentation gets under way, your wort will again be airless. Keep it that way throughout the rest of the process through to bottling.

You might be thinking that bottle conditioning cannot work now because

there is theoretically no air left to help the yeast grow. True, but there are enough healthy, viable yeast cells left in the beer to ferment the small additional amount of priming sugar that has been added. And if there is any air, the yeast will scavenge it out.

Keep your homebrew cool, keep the brewing process clean, and avoid oxidation and you should be enjoying your beer for a long, long time. 



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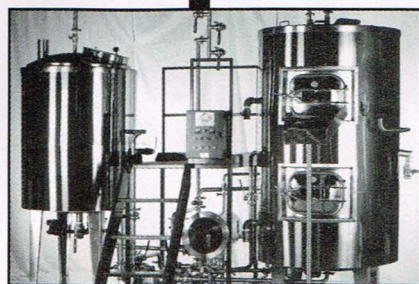
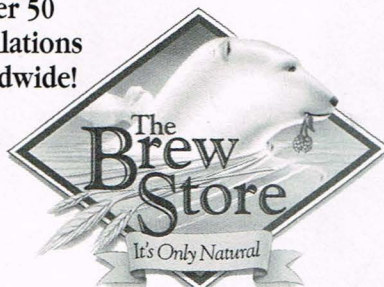
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MAKING EXCELLENT WINE FROM KITS

by Geoff Downton

In its origins the art of wine-making was an uncommon activity for the average person. It belonged to the people from the old country who carried the art through the generations. The grapes were only available once a year, and wine-making was a family affair with all contributing to make the year's supply. Winemaking has evolved greatly from its beginnings. It has been transformed from the simple act of stomping on grapes to a fine art in which the skill of the wine-maker has been executed in every batch. Through time, technology has made many advancements. New methods can now test the grape juice, reducing the chances for mistakes. Winemaking was then simplified so that the average person could be his or her own winemaker.

Kit wines started appearing on the market in tins of varietal grape juice concentrate about 25 years ago. The choices were few, but they were available year-round. The early winemaking enthusiast had to

add sugar and had to measure and adjust the wine himself. All additives and yeast were sold as extras.

In the late '80s complete kits appeared on the market. They contained everything necessary to make the wine. Suppliers started offering more varietals and blends. The convenience of these kits caught on. Anyone could easily make an acceptable wine with minimal equipment and the ability to follow simple directions. And with just a little bravery and patience you can make a superior wine from your average kit.

Wine Kits

Wine kits are available from several manufacturers. The kits themselves share a basic format. The most popular is the concentrate kit. Varietal juice is concentrated, blended, balanced, and then aseptically packaged in bladder bags. This type of kit is your best economic value. Kits blending stabilized juice (70 percent to 80 percent of



Popular Wine Kits

Key: Bordeaux (BX), Burgundy (BU), Cabernet Sauvignon (CS), Cabernet Franc (CF), Chablis (CH), Chardonnay (CD), Chenin Blanc (CB), Chianti (CT), Fumé Blanc (FB), Johannisberg Riesling (JR), Merlot (M), Pinot Blanc (PB), Pinot Noir (PN), Riesling (R), Sauvignon Blanc (SB), White Zinfandel (WZ), Zinfandel (Z)

Note: Some names such as Bergamais and Manoir Blanc are substitutes for trademarked French appellation names.

	kit	volume	yield	time until bottling	avail.: US or Canada	juice or conc.	contents/add pack	red	white
BREW KING	Chai Maison	5 L	23 L	3-4 weeks	Canada	conc.	bentonite, potassium metabisulphite, potassium sorbate, isinglass or gelatin finings, may contain regular oak chips	BX, BU, Bergamais, Cabernet, Vieux Chateau du Roi	CH, PB, R, SB, Liebfraumilch style
	Selection	15 L	23 L	6-8 weeks	US, Can.	juice plus conc.	bentonite, potassium sorbate, potassium metabisulphite, chitosan and colloidal silica finings; may contain regular, toasted, or French oak chips, dried elderflowers (in Piesporter), special finishing pack	CS, CS/M, CT, Chilean CS, Chilean M, French M, M, PN, WZ, Z, Barolo style, Domaine des Brumes, Petite Sirah, Val-de-Grace, Valpolicella style, Vieux Chateau du Roi, French CS	CH, CD/Semillon, Chilean CD, Chilean SB, JR, SB, CB, Gewurztraminer, Liebfraumilch style, Malvasia Bianca, Manoir Blanc, Niersteiner, Piesporter style, Ruisseau Blanc
	Selection Spéciale	7.5 L	11.5 L	6-8 weeks	US, Can.	juice plus conc.	bentonite, potassium sorbate, potassium metabisulphite, chitosan and colloidal silica finings; may contain toasted oak chips, special finishing pack	Constantia Red, Port	Cream Sherry, Dry Sherry, Icewine style
	Vintners Reserve	6 L	23 L	4-6 weeks	US, Can.	conc.	bentonite, potassium sorbate, potassium metabisulphite, isinglass or gelatin finings; may contain regular oak chips, dried elderflowers (in Piesporter), special finishing pack	Bergamais, CS, CH Blush, M, PN, WZ, Chat Dormant, Vieux Chateau du Roi, Red BX style, Red BU style, Ruby Cabernet, CT style, Valpolicella style, Rose, Coteau Royal, Jermillon, Medoc style	CB, CH, FB, R, PB, CD, SB, White BX style, White BU style, Brise-de-Mers, Gewurztraminer, Liebfraumilch style, Manoir Blanc, Mosel style, Piesporter style
CELLAR CRAFT	Cellar Craft Four-Week	5.5 L	23 L	4 weeks	Canada	juice plus conc.	liquid invert, acid, bentonite, gelatin, sodium silicate (white only), diammonium phosphate, potassium metabisulphite; may contain oak chips	CS, CT, M, PN, Chateau du Pays, BeauSoleil, Caves de Bordeaux	CB, CD, FB, JR, Caves de Bordeaux, Liebfraumilch, Poussé Blanc, California CH
	Cellar Craft Six Week	15 L	23 L	6 weeks	Canada	juice plus conc.	liquid invert, acid, bentonite, gelatin, sodium silicate (white only), diammonium phosphate, potassium metabisulphite; may contain oak chips	CS/M, M, PN, Z, Chilean CS, Chateau du Pays, BeauSoleil, Caves de Bordeaux, Valpolicella, Blush Z, Nebbiolo,	CB, CD, FB, JR, Pousse Blanc, Caves de Bordeaux, Piesporter, California CH, Late Harvest Reisling, French Colombar
LINDSTROM	Grand Maison Reserve	5.5 L	23 L	4 weeks	US, Can.	conc.	potassium metabisulphite, potassium sorbate, isinglass, bentonite	most European styles available including CT, Grande Cote, Barolo, Valpolicella	most European styles available including CB, Piesporter, Gewurztraminer,
	Magnum	5.7 L	23 L	4 weeks	US, Can.	conc.	potassium sorbate, potassium metabisulphite, isinglass, bentonite	33 styles available including CS, WZ, Port, Shiraz	33 styles available including CD, Pinot Gris, Verdicchio
	Magnum Aristocrat	15 L	23 L	6 weeks	US, Can.	juice plus conc.	potassium sorbate, potassium metabisulphite, isinglass, bentonite	22 styles available including CS, PN, Harve du Pape	22 styles available including CD, CH, R
	Premier Coastal Reserve	5.5 L	23 L	4 weeks	US, Can.	conc.	potassium sorbate, potassium metabisulphite, isinglass, bentonite	18 styles available	18 styles available including White BX, Moselle, Liebfraumilch
MOSTI MODIALE	Domaine Tradition	5.5 L	23 L	10-28 days	US, Can.	conc.	Bentonite, stabilizer (sorbate, metabisulphite), clarifier (isinglass); may contain liquid invert sugar, tartaric acid, malic acid, citric acid, oenologic tannin	BU, CS, CT, M, PN, Z, Barolo, Z Blush, Barbera, Lambrusco, Sangiovese	CD, Type CH, CB, R, SB, Traminer, Semillon, Pinot Grigio, Piesporter, Soave, Muller-Thurgau
	Fresh Varietal Must	20, 23, 100 L	20, 23, 100 L	1 year	Canada	juice	none	CF, CS, M, PN, Alicante, Ruby Cabernet, Type BU, Montepulciano, Z Royal, Carrignane, Petite Syrah, Barbera, Grenache, Mission, Z Blush	CB, SB, JR, Moscato, Palomino, Type CH, Trebbiano, Tocai, Pinot CD, Gewurztraminer, Thompson "Mix", Vinho Verde Type, French Colombar, Pinot Grigio
	Fresh Must from Argentina	20, 23 L	20, 23 L	1 year	Canada	juice	none	CS, M, Malbeck, Barbera (Bonarda)	CB, SB, CD, R, Type CH

*information provided by the manufacturers

the kit) with concentrate are more expensive, but they are usually worth the cost in the end. These kits usually make a nicer finished product that tends to keep longer in the bottle.

All kits have the same basic ingredients: grape concentrate and/or juice, potassium sorbate, potassium metabisulphite, and fining agents to clarify the wine. Most kinds include dry wine-making yeast and a yeast energizer or nutrient. Potassium sorbate and potassium metabisulphite are used to stabilize the wine and prevent further fermentation. Fining agents aid in clearing the wine and may include one or more of the following: glycerin, kieselsol, isinglass, bentonite, sparkolloyd, or Isoclear. Despite their chemical-sounding names, all of these ingredients are derived from natural sources.

Each kit, regardless of manufacturer, comes complete with directions for making wine. You can, however, make a far superior wine than the kit produces by going a little beyond the

written directions. By simply adding a few extra ingredients (which equals a few extra steps) you will have a wine that is truly your own and far more enjoyable than the results of a basic kit.

Beyond the Basics

The additional ingredients used to enhance the quality of the wine are few but highly effective. You can add more as you acquire experience to enhance specific wines. A basic "tweaking" kit should include:

Oak: Aging in oak barrels is a process used in almost all commercial red wines and many white wines. It adds complexity and structure to the wine. When making wine at home the use of barrels is difficult and cost prohibitive. Through the use of liquid oak or oak chips you can simulate the barrel-aged wines at home. Oak gives wine many flavors, ranging from the light smoky flavor found in a good fumé blanc to the warm vanilla notes in a good gamay. Liquid oak is acquired by extracting the essence of oak from

barrels and then holding it in an alcohol base. Liquid oak will instantly add oak flavoring to your wine, but it lacks the complexity of chips. Oak chips are milled from barrels and are available in toasted and untoasted styles, light to dark, and in French or American varieties. They demand more work than liquid oak, but the results are worth it.

Tannins: Tannins occur naturally in wines, particularly red wines, and add complexity and depth. Their natural source is the skin of the grape. Tannins give the wine its astringency and dryness. The sensation of tannins on the palate is often described as that of an aspirin tablet dissolving on the tongue. The same puckering of your mouth is sometimes experienced when drinking wine. Tannin additives for kits are available in liquid and powdered form. The liquid form is easier to use.

Glycerin: Glycerin is used to smooth and refine the roughness of your wine and make it ready for the table sooner. Use it sparingly; as the wine ages, the flavors will soften naturally and excess

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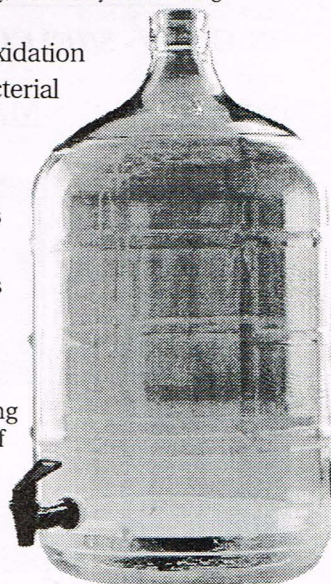
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glycerin will make your wine flabby and tasteless. One rule is to never use more than two teaspoons per batch.

Wine Conditioner: Conditioner is merely liquid invert sugar that is stabilized with potassium sorbate. It adds sweetness to your wine. You can make your own conditioner by bringing to a low boil a solution of two parts sugar to one part water. When the sugar is completely dissolved, let the mixture cool and clear.



Winemaking Gear

The equipment needed to make wine from kits is inexpensive and familiar to homebrewers:

- 30-liter or larger fermenter for primary fermentation (a food-grade plastic pail will do)
- 23-liter carboy (glass is preferred)
- Siphon setup (stiff rod with anti-sediment tip and flexible hose with shut-off)
- Hydrometer
- Thermometer
- Stir spoon or paddle

Before starting any batch of wine make sure your equipment is clean. Without proper cleanliness you are unable to regulate the final product. There are several ways to sanitize your equipment. Your local retailer can help you choose the best method.

Making Wine

Wine instructions are structured based on the age of your must/wine. Tweaking the kit wine will only require a couple of alterations.

Day one: Follow the directions in your kit for day one, but hold aside four to eight ounces of concentrate. Put this concentrate in a sanitized container (food grade) and place it in the refrigerator or freezer until day 20. (If you are making a 15-liter kit, hold back two to 2.5 times as much and freeze). Add one cup of table sugar to the mixture (called must) to keep the specific gravity at the proper level (to compensate for the removed concentrate). The specific gravity measured with your hydrometer should be 1.080 plus or minus 0.005. If it is higher, your wine will be higher in alcohol. Pitch your yeast by warming the must to 80° F and sprinkling the yeast on the surface. There is no need to stir.

Day six to eight: Rack your wine from the primary fermenter to the carboy using your siphon. Your specific gravity should be around 1.020 or lower. Do not be afraid of transferring some sediment, but try to keep the amount low. Most kit instructions will have you top up your wine with water.

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Popular Wine Kits

	kit	volume	yield	time until bottling	avail.: US or Canada	juice or conc.	contents/add pack	red	white
MOSTI MODIALE	Riserva "Mondiale"	15 L	23 L	8 weeks	US, Can.	juice plus conc.	Bentonite, stabilizer (sorbate and metabisulphite), clarifier (isinglass); may contain oak, conditioner, liquid invert sugar, tartaric acid, malic acid, citric acid, oenologic tannin	BU, CT, CS (Ital. and California), M, PN, WZ, Z, Novello, Blanc de Noirs, Barolo, Gamay, Nebbiolo	CB, CD, R, SB, Muscatel, Blanc de Blancs, Pinot Alto Adige, Tocai del Veneto, Gewurztraminer
	Riserva "Noble"	8 L	23 L	6 weeks	US, Can.	juice plus conc.	Bentonite, stabilizer (sorbate, metabisulphite), clarifier (isinglass); may contain liquid invert sugar, tartaric acid, malic acid, citric acid, oenologic tannin	Type BU, CT, CS, M, PN, Z, Orchard Red, Spring Red, Blanc de Noir	CB, CD, Type CH, R, SB, Orchard White, Spring White, Muscatel
	Sonoma Edition (Juice with skins)	22.7 L	20 L	1 year	Canada	juice	none	CS, M, PN, Z	none
	Sterile Must	23 L	23 L	10 weeks	US, Can.	juice	Bentonite, stabilizer (sorbate, metabisulphite), clarifier (isinglass); may contain liquid invert sugar, tartaric acid, malic acid, citric acid, oenologic tannin	Type BU, CS, CS/M, M, PN, Z, Montepulciano, Lambrusco	CB, SB, CD, R, Type CH, Z Blush, Soave "Mondiale", Traminer, Trebbiano
R.J. GRAPE	Australian Conical Distilled	7 kg	12 L	6 weeks	US, Can.	juice plus conc.	tartaric acid, citric acid, malic acid, pectinase, ascorbic acid, oak chips	CS, Shiraz	CD, R, SB
	Cru Select	16 L	23 L	6 weeks	US, Can.	juice plus conc.	tartaric acid, citric acid, malic acid, bentonite, tannin, potassium sorbate, isinglass, potassium metabisulphite, ascorbic acid, oak chips, diammonium phosphate	CS, PN, Barolo, Bergamais, Cabernet-Shiraz, Domaines des Brumes, Vieux Chateau du Roi	CH, CD, FB, JR, SB, Gewurztraminer, Late Harvest R
	Grand Cru	7 kg	23 L	4 weeks	US, Can.	juice plus conc.	liquid invert sugar, tartaric acid, citric acid, malic acid, bentonite, potassium sorbate, isinglass, pectinase, ascorbic acid, potassium metabisulphite	CS, CT, M, PN, Barolo, Bergamais, Chat Dormant, Coteau Royal, Medoc, Petit Sirah, Vieux Chateau du Roi, Red BX, Valpolicella, Red BU, Z Blush	CH, CB, FB, JR, PB, R, SB, Cuvee Blanc, French Colombard, Gewurztraminer, Brise-de-Mers, Liebfraumilch, Manoir Blanc, Moselle, Piesporter, Pinot CD, Pinot Gris, Ruisseau Blanc, White BX, White BU, Verdicchio
	Specialty	7 kg	12 L	6 weeks	US, Can.	conc.	tartaric acid, citric acid, malic acid, pectinase, ascorbic acid, oak chips, bentonite, potassium sorbate, isinglass, potassium metabisulphite	Port style	Ice wine style, Sherry style
R.J. GRAPE	Vineyard's Choice	15 L	23 L	6 weeks	US, Can.	juice plus conc.	invert sugar, tartaric acid, citric acid, malic acid, pectinase, tannin, ascorbic acid, oak chips, bentonite, potassium sorbate, potassium metabisulphite, isinglass	CS, Chilean M, Chilean Bergamais, Chilean PN, Australian Mataro/European Mourvedre, Australian Shiraz, Spanish Rioja, California Cabernet Blush, Portugese Style Rose	Chilean CH, Chilean CD, Chilean R, Chilean SB, Australian Muscat, Italian Pinot Grigio, Alsacian Auxerrois
	Vineyard's Choice	7 kg	23 L	4 weeks	US, Can.	juice plus conc.	invert sugar, tannin, tartaric acid, citric acid, malic acid, pectinase, ascorbic acid, bentonite, potassium sorbate, potassium metabisulphite, isinglass	CS, CT, PN, M, Barolo, Bergamais, Vieux Chateau du Roi, Red BX, Red BU, Vin Rouge, Ruby Cabernet, Valpolicella, Rose, Red Z	CH, CB, FB, JR, PB, R, SB, French Colombard, Gewurztraminer, Liebfraumilch, Pinot CD, White BU, White BX, Piesporter, Moselle, Brise-de Mers, Vin Blanc
SEIGNEURIE	Château des Terrasses	15 L	23 L	6 weeks	Canada	juice plus conc.	tartaric acid, isinglass, potassium sorbate, potassium metabisulphite; may contain liquid invert sugar, oak chips	CS, PN, Barolo, Grande Côte Supérieure, Grande Cuvée du Pape, Z Royale	CD, PB, SB, Gewurztraminer, Liebfraumilch, Muscatel
	Grand Réserve du Château	8 L	23 L	4 weeks	US, Can.	juice plus conc.	liquid invert sugar, tartaric, malic and citric acids, isinglass, potassium sorbate, potassium metabisulphite	CS, CT, M, PN, Grande Chateau Neuf, Cotes Superieure Rouge, Shiraz, Z Blush, Z Royale	CH, R, SB, Blanc de Blancs, Gewurztraminer, Liebfraumilch, Muscatel, Piesporter, Pinot CD

*information provided by the manufacturers

Popular Wine Kits

	kit	volume	yield	time until bottling	avail.: US or Canada	juice or conc.	contents/add pack	red	white
SEIGNEURIE	Réserve du Château	5.5 L	23 L	4 weeks	Canada	conc.	liquid invert sugar, tartaric, malic and citric acids, isinglass, potassium sorbate, potassium metabisulphite	CS, CT, M, PN, Côtes Supérieure Rouge, Cuvée du Pape Rouge, Valpolicella, Z Royale	CH, R, SB, Blanc de Blancs, Gewürztraminer, Liebfraumilch, Muscatel, Pinot CD
	Vino Europa	8 L	23 L	4 weeks	US, Can.	juice plus conc.	liquid invert sugar, tartaric, malic and citric acids, isinglass, potassium sorbate, potassium metabisulphite	CS, CT, M, PN, Z, Cuvée du Pape, Grand Côtes Rouge, Réserve du Château, Blanc de Nuit	CB, R, SB, Bianco Fino, Pinot CD, Liebfraumilch, Muscatel, Piesporter, Premier Cru Blanc
SPAGNOL'S	Ancient Vines	10 L	23 L	6 weeks	US, Can.	blend	invert sugar, glucose, malic acid, diammonium phosphate, gelatin, potassium sorbate, sodium metabisulphite, bentonite; may contain oak, elderberries, kieselsol, glycerin, tannin, natural flavors	CS, M, WZ, Shiraz, Vieux Château du Roi	CD, SB, Gewürztraminer
	Cellar Classic	15 L	23 L	6 weeks	US, Can.	blend	liquid invert sugar, malic acid, liquid glucose, liquid gelatin, tartaric acid, pectic enzyme, potassium sorbate, diammonium phosphate, bentonite, potassium metabisulphite; may contain oak, kieselsol, tannin, elderberries, glycerin, natural flavors	CS, CS/M, CT, M, PN, WZ, Z Barbera, Barolo, Bergamais, CS/Shiraz blend, Chat Dormant, Domaine des Brumes, Jermillon, Lemberger, Red BU, Shiraz, Val-de-Grace, Valpolicella, Vieux Château du Roi	CB, CH, CD, FB, JR, SB, Brise-de-Mers, Liebfraumilch, CD/Semillon, Semillon, Gewürztraminer, Piesporter, Ruisseau Blanc, Verdicchio,
SPAGNOL'S	Cellar Master	5 L	23 L	4 weeks	US, Can.	conc.	invert sugar, glucose, malic acid, bentonite, diammonium phosphate, potassium sorbate, sodium metabisulphite, gelatin; may contain oak, kieselsol, elderberries, glycerin, tannin, natural flavors	CS, CT, PN, M, WZ, Barolo, Bergamais, California Red, Chat Dormant, Red BX, Red BU, Shiraz, Domaine des Brumes, Jermillon, Val-de-Grace, Valpolicella, Vieux Château du Roi	CB, CH, CD, FB, JR, SB, White BX, White BU, Brise-de-Mers, Ice Wine style, California White, French Colombard, Gewürztraminer, Liebfraumilch, Mosel, Piesporter, Rioja Blanco, Niersteiner, Soave, Ruisseau Blanc, Verdicchio
	Signature Series	16 L	23 L (11.5 L)	45, 60 days	US, Can.	blend	liquid invert sugar, malic acid, liquid glucose, diammonium phosphate, potassium sorbate, sodium metabisulphite, bentonite, liquid gelatin; may contain oak, kieselsol, elderberries, glycerin, tannin, natural flavors	CS/M	SB, Riesling Ice Wine, Muscat Canelli Dessert Wine
SPAGNOL'S	Vino del Vida	7 L	23 L	4 weeks	US, Can.	blend	invert sugar, glucose, potassium sorbate, malic acid, bentonite, diammonium phosphate, gelatin, potassium metabisulphite; may contain oak, kieselsol, elderberries, glycerin, tannin, natural flavors	CS, CT, M, PN, WZ, Barolo, California Red, Bergamais, Chat Dormant, Domaine des Brumes, Jermillon, Red BX, Red BU, Shiraz, Vieux Château du Roi, Val-de-Grace, Valpolicella,	CB, CH, CD, FB, JR, SB, Brise-de-Mers, California White, French Colombard, Piesporter, Gewürztraminer, Liebfraumilch, Manoir Blanc, Mosel, Niersteiner, Ruisseau Blanc, Semillon, Verdicchio, White BU
	Woodbridge Estates	5 L	23 L (11.5 L)	4 weeks	US, Can.	conc.	invert sugar (and/or fructose syrup), glucose, malic acid, tartaric acid, diammonium phosphate, bentonite, gelatin, potassium metabisulphite, potassium sorbate; may contain oak, kieselsol, elderberries, glycerin, tannin, natural flavors	CS, CT, M, PN, WZ, Barolo, Bergamais, California Red, Chat Dormant, Domaine des Brumes, Jermillon, Port, Red BX, Red BU, Shiraz, Val-de-Grace, Valpolicella, Vieux Chateau du Roi	CB, CH, CD, FB, JR, SB, Brise-de-mers, California White, French Colombard, Liebfraumilch, Gewürztraminer, Mosel, White BX, White BU, Niersteiner, Piesporter, Rioja Blanco, Ruisseau Blanc, Sherry, Soave, Verdicchio
VINOTHEQUE	Cuvee Vendage	15 L	23 L	6-8 weeks	US, Can.	blend	potassium sorbate, potassium metabisulphite, gelatin, sodium silicate	CS, CS/M, CT, M, PN, WZ, Z, Barolo, Barbera, Bourgogne/BU, Domaine des Brumes, Jermillon, Monte Pulciano, Shiraz, Vieux Chateau du Roi	CB, CD, CH, JR, SB, Ruisseau Blanc, Gewürztraminer, Manoir Blanc, Liebfraumilch, Semillon CD
	Mosto Classico Fresh Juice	23 L	23 L	10-26 weeks	US, Can.	juice		BU, CS, M, PN, Z, Alicante, Ruby Cabernet, Vieux Château du Roi, Red BX type, Barbera	CB, CH, FB, JR, R, SB, Muscat, White BU type, French Colombard, Pinot CD, Semillon, Gewürztraminer, Liebfraumilch type, Rosé

*information provided by the manufacturers

While this will reduce the risk of oxidation, it will water down your wine. It is preferable to top up with a similar wine. At this point, however, many wine makers believe that oxidation is of little concern because CO₂ is still being released, so topping up is optional.

Day 20 or 21: This is the time to make the wine your own; let the winemaker's art show! Pull out your tweaking kit and get your palate ready. Rack the wine from your carboy into your primary fermenter. Do not use any of the additives yet. Remove two six-ounce glasses of wine. Use one to tweak your wine and one as a comparison.

Have a small sip of the wine. It may be a little yeasty now, but this taste will dissipate as the wine clears over the next week. Get ready to use your additives, making adjustments to the wine in your glass. Do not add anything to your fermenter until you achieve the taste you are looking for in the glass. Except in the case of the oak chips, you will add the ingredients to the sample glass by dipping a toothpick into the additive (about one-half inch deep) and then mixing it with your wine. Keep track of the number of times you dip your toothpick — you will use that number to approximate how much of the additive to use in your fermenter.

Let your reserved concentrate return to room temperature. Add a small amount (using the toothpick) to your glass and taste again. This should smooth out the wine and add some fruit flavors. Add the concentrate bit by bit until you are happy with the taste.

Add glycerin sparingly to soften your wine. Remember, excess glycerin can ruin the wine.

For most white wines these two steps should be sufficient to perk up the taste. If you want a sweeter wine, such as a piesporter, and the wine is fruity enough for your tastes, add the wine conditioner with a toothpick.

Tannin should be added only to red wines. Notice how this gives the wine a velvety smoothness. Continue until you achieve the taste you enjoy.

Oak can be added to reds or whites. Chardonnay, sauvignon blanc, and many noble varieties of whites can benefit from oak. Almost all reds will benefit from oak. Oak can be added in two ways. Liquid oak can be added to

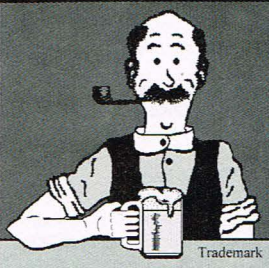
the wine by using the toothpick method. The addition of oak chips is more difficult. Start by stirring the wine in the primary fermenter to remove the CO₂ (stir for five minutes three times, letting the wine rest five minutes between stirs). Add the potassium sorbate and potassium sulfite, and move the wine into a clean carboy. Rinse about 25 grams of oak chips and add them to the carboy. Taste the wine

every two days until the oak flavor appears. Next, taste every day until the desired level is reached. Rack the wine off the oak chips into a clean carboy. If you have not yet tweaked the wine with the additives, do so now. If you have, add the finings per kit instructions.

When you have achieved the desired taste in your sample glass, add the concentrate and conditioner at approximately one ounce to the

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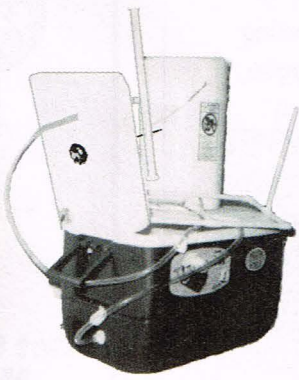
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Popular Wine Kits

kit	volume	yield	time until bottling	avail.: US or Canada	juice or conc.	contents/add pack	red	white
VINO THEQUE Village Vintner	5 L	23 L	4 weeks	US, Can.	conc	potassium sorbate, potassium metabisulphite, chitin, sodium silicate	CS, CT, M, PN, Z, Barolo Supérieur, Bergamais, California House Red, Chat Dormant, Côteau Royal Red, Jermillon, Malbec, Médoc, Petite Syrah, Red BU Style, Red BX Style, Rioja Tinto, Rosé, Ruby Cabernet, Valpolicella, Vieux Château du Roi, Val-de-Grace Red, Vinho Verde Red, Z Blush	CB, FB, JR, PB, R, SB, Brise-de-Mers, California House White, Côteau Royal White, Premium CH, French Colombard, Liebfraumilch, Gewurztraminer, Hock, Manoir Blanc, Moselle, Piesporter, Pinot CD, Pinot Grigio, Ruisseau Blanc, Sauternes, Soave, Sémillon, Val-de-Grace White, Vinho Verde White, Val du Domaine White, White BU Style, White BX Style
VINO THEQUE Vintage Harvest 100% Chilean	7.1 L	23 L	6-8 weeks	US, Can.	conc	potassium sorbate, potassium metabisulphite, chitin, sodium silicate	CH, CD, R, SB	CS, M, PN, Bergamais
VINO THEQUE Vintage Harvest Specialty Wines	3.6 L (5.2 L in ice wine)	11.3 L (12 L in ice wine)	4-7 weeks (6-7 for ice wine)	US, Can.	blend	potassium sorbate; may contain isinglass, sodium silicate, potassium metabisulphite, gelatin, sweet reserve (for sherry and port kits)		Ice wine, Sherry, Port
WINE-ART Wine-Art Four-Week		23 L	4 weeks		conc.		BU, BX, CS, CT, M, PN, Mataro, Bergamais, Cabernet-Merlot, Chat Dormant, Jermillon, Valpolicella, Vieux Chateau du-Roi	BU, BX, CH, CD, R, SB, Blush, Bernkastler, Brise-de-Mers, Dry White, Frontignan, Liebfraumilch, Gewurztraminer, Hock, Moselle, Oaked CD, Piesporter

**information provided by the manufacturers*

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Popular Wine Kits

	kit	volume	yield	time until bottling	avail.: US or Canada	juice or conc.	contents/add pack	red	white
ART WINE	Wine-Art Gold	15 L	23 L	6-8 weeks				M, CS, Vieux Chateau du Roi, Barolo	CH, CD, R, SB
	Wine-Art Home Winery Dry		10 L	3 weeks				Red Burgundy	White Chablis
	Wine-Art Ice Wine Style and Premium Dessert Wines		12 L	4 weeks				Ruby Port	Gordo Blanco Ice Style Wine, Riesling Ice Style Wine, Gewurztraminer Ice Style Wine
WINE TIME	Ultra Wine Kit	7.7 kg	23 L	4 weeks	Canada	conc.	potassium sorbate, potassium metabisulphite, isinglass, bentonite,	All Wine-Time kit lines available in:	All Wine-Time kit lines available in:
	Vineyards Elite Wine Kit	6.7 kg	19, 23 L	4 weeks	Canada	conc.	potassium sorbate, potassium metabisulphite, isinglass, bentonite	BU Rouge, BX Rouge, CS, CT, M, PN, Z, Bardolino, Barolo, Bergamais, Chat Dormant, Coteau Royal, Jermillon, L'Als, Rosé, Shiraz, Valpolicella, Vieux Chateau Du Roi	CB, CH, PB, R, SB, BU Blanc, BX Blanc, Pinot CD, Blanc de Blanc, Cote D'Or, Blush, Brise-de-Mers, Cuvée Reserve Blanc, Cuvée Spéciale, French Columbard, Gewurtztraminer, Liebfraumilch, Manoir Blanc, Moselle, Rioja Blanco, Ruisseau Blanc, Sauterne, Sélectionné Blanc, Soave, Val-De-Grace, Vinho Verde
	Vineyards Elite Premium	15 kg	23 L	6-8 weeks	Canada	blend	potassium sorbate, potassium metabisulphite, isinglass, bentonite		

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toothpick. Oak, tannin, and glycerin are added at approximately one teaspoon per toothpick. Stir the wine and compare the taste to the glass you have tuned up. Add more of the ingredients to the primary as needed to achieve the same taste that's in your glass.

Continue with the day-20 instructions for adding the additives included in the kit.

As you become more experienced,

you can add other things to further enhance the flavors in your wine. By reading winemaking articles and talking to your supplier, you can determine what to use to make your wine exemplary. The basic rule is anything goes. Experimenting is fun and allows the art of the winemaker to blossom. Home winemaking is no longer relegated to the Old World masters. You, too, can make exquisite wine. 

Types of Wine Kits

There are several types of wine kits on the market. The most popular is the 28-day kit. It contains a mix of concentrated grape juice and some concentrated sugars. All additives necessary to complete the wine are included. The finished wine is usually ready for consumption when bottled. Some aging will improve the wine, but as a rule all wine made from 28-day kits should be consumed within a year to 18 months.

The next step up is the six-week kit. This contains a juice/concentrate mix of approximately 70 percent to 80 percent juice with the remaining volume concentrate and sugars. The cost is greater, but this kit can produce a better wine. Age the finished wine for two to three months for the best results. The wine from these kits will improve for up to a year. Consume white wines within two years and red wines within three years.

Another way to make a wine is with 100 percent juice. It is available in fresh or aseptically packaged varieties. The aseptically packaged juice usually comes with the necessary additives. Aseptically packaged juice can give you a more premium wine and is available year round. Treat this wine as you would a six-week kit.

Fresh juice is available only in season and, depending on the source, it may have additives and yeast included. The quality of the juice will determine the quality of the finished wine. You will have to trust your retailer on the source and quality. Generally speaking, free-run juice, also called first-run juice, will give you the best results. These wines generally require long aging times: three to six months for white and eight months to a year for reds. Experiment with juice when you have time to let it age properly.

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Brewing at the Rio Grande

by Stan Hieronymus and
Daria Labinsky

Scott Moore and Tom Hart once dreamed of opening a \$6 million regional brewery. Instead, they ended up with a \$600 used dairy tank at the heart of their 30-barrel brewery, the Rio Grande Brewing Co. in Albuquerque, N.M.

"Tom found the tank in a dairy in Los Lunas (N.M.), and we built the system around it," Moore says. "It was originally a milk cooler. We reversed the coils and now run steam through it." Everything else in the brewery was

scaled to brewing in the 1,000-gallon tank.

When Moore starts describing the birth of Rio Grande, he makes it sound almost simple. "What we've got going on here is, basically, homebrew gone wild," he says. The equipment takes up more room than at home, but "it's all done a lot like your basic three-tier homebrew system."

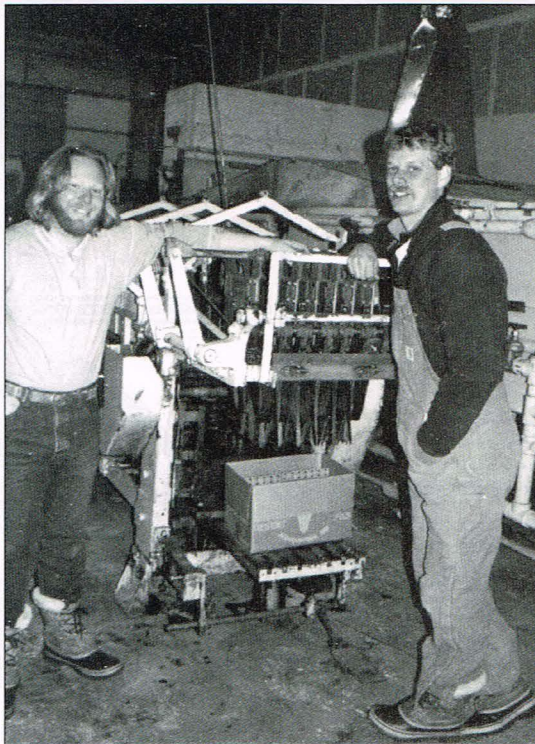
Moore appears prominently in "Franken Brew," a video made by Tom Hennessy of the Il Vicino brewpubs. The video describes how to build a microbrewery for less than \$20,000. At one point Moore refers to a piece of equipment in his hands as "these clamp guys." He also shows a pump they mounted on a skateboard, and later on a dolly truck, rather than spend \$150 to \$250 more for a pump that comes attached to a stainless steel platform on wheels.

Moore and Hart were already experienced homebrewing hobbyists — Moore was a Shakespearean scholar, Hart was, and remains, a Presbyterian minister — when they started building brewing systems together.

Each one was larger than the last, as they went from five gallons to 10 to 30, then built a double mash tun and, eventually, a 1,000-gallon system. They used "anything stainless that would hold water." That included soup kettles, a candy cooker, and parts from salvage yards.

They weren't afraid to stop and ask people if they wanted to sell something sitting beside their houses. "This is New Mexico. You see a lot of people with junk in their yards," Moore says.

In 1991 Hart and Moore started thinking about turning pro. "A lot of people drank our beer and said, 'Oh, man, you should sell that.' Unfortunately, we took them seriously," Moore jokes. He and Hart considered opening a brewpub but decided they



Scott Moore
and Tom Hart's
bottling machine
is one of their
few pieces of
equipment
actually designed
for brewing.

weren't interested in running a restaurant. They worked on various brewing projects for about a year and tried to

raise capital for a \$6 million regional brewery. Failing in that, they started putting together a brewery and

recruited another partner, Matt Shappell, who has since left the company. Moore says Shappell woke up one day and thought, "I don't want to spend a half million dollars and go into some serious debt, and then have to be at this place from 10 a.m. until 2 a.m., dealing with a huge staff, a lot of cash business...I just want to make beer."

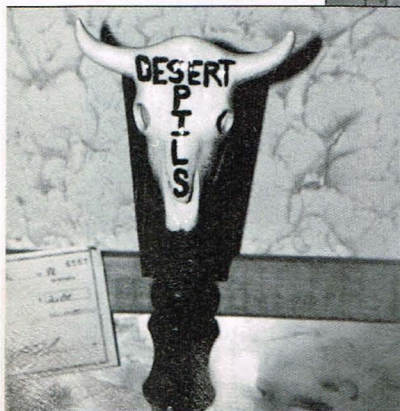
The partners found in an industrial park 2,400 square feet of warehouse space (a former winery), which they later doubled. They made major modifications to a wine fermenter, adding a false bottom and legs, among other changes, to create a very efficient mash tun.

The tun conversion illustrates that where the equipment comes from and what it looks like aren't as important as how well it works. Their extraction rate approaches that of large breweries using equipment built (at a considerably higher price) just for brewing.

The hot liquor tank was a dairy pasteurizer in a former life, and Hart



Rio Grande's 1,000-gallon brewing system (above) is a far cry from the soup kettles the brewers used in the beginning. Rio Grande's beers are easily identified by distinctive cow-skull tap handles.



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built the counter-pressure keg filler, but other equipment at Rio Grande was actually designed for a brewery. The pasteurizer used to belong to Buffalo (N.Y.) Brewing Co., which in turn had bought it from F.X. Matt of Utica, N.Y. The unitanks came from Riverside Brewing Co. (in Riverside, Calif.), and other pieces of equipment have similar histories.

The cold glue labeler, however, is new. "The old one (a sticker labeler) was the bad link in the chain," Moore says. "We cut our labeling costs by two-thirds." The recently installed Kronos bottle filler will let them fill up to 600 bottles a minute. Moore and Hart handle virtually all the work, from brewing to bottling, so tours are not offered on a regular basis.

All three of Rio Grande's year-round beers are clean, flavorful lagers that are filtered and conditioned for

three weeks. Outlaw Lager, based on a steam beer Hart made as a homebrewer, debuted in June 1994 and is still the brewery's top seller. It's deep gold in color, with a slightly sweet nose and the fruitiness (but not sweetness) and rounded mouthfeel characteristic of a steam beer's warmer fermentation. It finishes dry and clean, with a lingering hoppiness.

Desert Pils is a German-style pilsner with a flowery hop nose and light gold color. It's not intensely hoppy but finishes dry. Elfego Bock, named for New Mexican folk hero Elfego Baca, is in the Vienna-lager style. Medium-brown with red tints, it has a nutty nose and maltiness throughout. A bit of the flavor comes from chocolate and patent malt.

"If you mix them up, they mellow each other out," Moore says. They are added at the beginning of the sparge

and make up only a small percentage of the malt bill.

Rio Grande uses a California lager yeast from Wyeast for all its beers, usually repitching after 10 to 12 batches. "We used different strains to begin with, but we can control the temperature to get different flavors," Moore says. The year-round beers are all between 4.5 and 5 percent alcohol by volume.

The seasonal beers include Pancho Verde Chile Cerveza, a silver medal winner at the 1996 Great American Beer Festival. Moore won't disclose how it's made but said it will become a year-round beer starting in June. Bock Holiday, a nutty doppelbock, is the brewery's winter beer. This year it weighed in at just over 6.5 percent alcohol by volume.

The regulars are all warmer-weather beers, and the long

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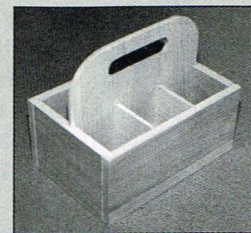
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Southwestern summer is the make-or-break season for Rio Grande Brewing. Sales double during the summer months, due in part to tourists. "We brew two times a month in the winter and three to five times a month in the summertime," Moore says.

Between two-thirds and three-quarters of the 1,000 barrels Rio Grande brews each year are bottled, so shelf stability is essential. Thus, the beers are filtered and pasteurized. "Mexican beers are all pasteurized, and it doesn't seem to make a difference," says Moore, a longtime fan of south-of-the-border beer.

Rio Grande has about 300 accounts in New Mexico, Oklahoma, and Arizona. Draft sales have picked up recently, but overall competition is fierce. Price points continue to fall, and because it's cheap for breweries outside of New Mexico to obtain licenses to sell in the state, there's always a new beer fighting for consumers' attention.

The Southwest/outlaw mystique plays prominently in the brewery's image. The beers are easily spotted by their distinctive cow-skull tap handles and the cow skulls on the bottle labels. Rio Grande has trademarked slogans such as "New Mexico's most wanted" and "Reward yourself." That's good business, but it's also fun. The labels feature the letters "JKS," which Hart refers to as "our 33" — a secret symbol, similar to the "33" on Rolling Rock labels.

"There's a big mystery around making beer," Moore says. He finds himself bombarded with questions when he's out checking the quality of Rio Grande beer in the marketplace. People have come up to him and said things like, "Wow, you really make beer. I thought only big companies could do that."

Moore and Hart know that it can be done for a lot less than \$6 million.

Rio Grande Brewing Co. is located at 3760 Hawkins NE, Albuquerque, N.M. 87109. Call (505) 343-0903. ■

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

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My Passover Dilemma

by Al Dubinsky

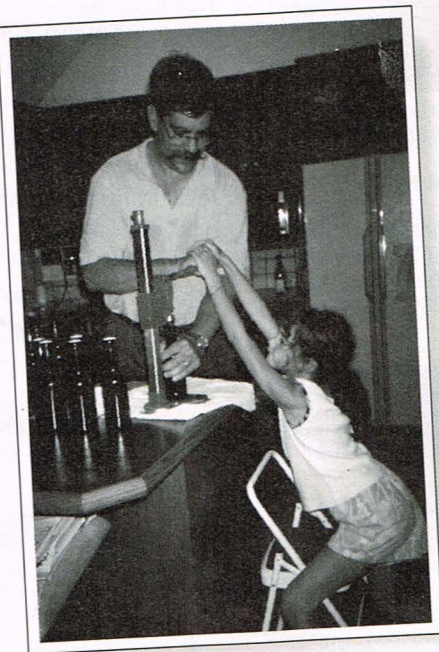
As a fairly observant Jew, I take great comfort in knowing that the beer I make is kosher. When something is kosher, it means that a specially trained rabbi has certified that it conforms to the Jewish dietary laws. This includes the commonly known restrictions on pork and ham, and not mixing milk and meat products. It also means that each step in the production process has been inspected, and any item that comes from an animal is checked for conformity. This applies to anything that comes in contact with food, which explains why kosher trademarks appear on many items, such as soap, plastic bags, and aluminum foil.

Of course, since beer contains no animal products (except for that Cock Ale recipe in *The New Complete Joy of Homebrewing* that uses an old chicken), just about any homebrew is kosher, as long as you don't use your brewpot to make pork and beans. Normally, this poses no particular problems or concerns. During the eight-day festival of Passover however, this is not the case.

Passover commemorates the liberation of the Israelites from bondage and slavery under the Egyptian Pharaoh. After suffering 10 plagues, Pharaoh finally agreed to let the Israelites leave. But they had to do so immediately. Because of this, they didn't have time for their bread to rise and had to eat it unleavened. To remember this, during Passover Jews eat matzo, which is unleavened bread. Observing the holiday goes beyond this, however, for those of us who keep a kosher home. In preparation for Passover, we go to great lengths to rid our homes of any items that contain grains, grain products, or leavening of any kind (called *chometz* in Hebrew). This includes the obvious, such as bread, cereal, beer, and whisky, and the not so obvious, such as candy, since it contains corn

sugar, a grain-based item. We even have separate dishes that we use just during Passover. Obviously, brewing beer, not to mention drinking beer, is not allowed.

That is not to say that all alcoholic beverages are prohibited. Wine plays an integral role in the seder, or Passover meal, during which the story of the exodus is told. Four glasses of wine are drunk during this meal.



Bottling the Passover mead is a family activity.

Wine is used in many of the delicious dishes that are prepared. Having so many restrictions on what can and can't be used during Passover forces people to be very creative in what and how they cook. Matzo meal instead of flour for example. Whipped egg whites to make cakes rise. Honey is used extensively as a sweetener.

This last item got me thinking. I've been homebrewing for many years. Why can't I make mead during Passover? Since mead is fermented

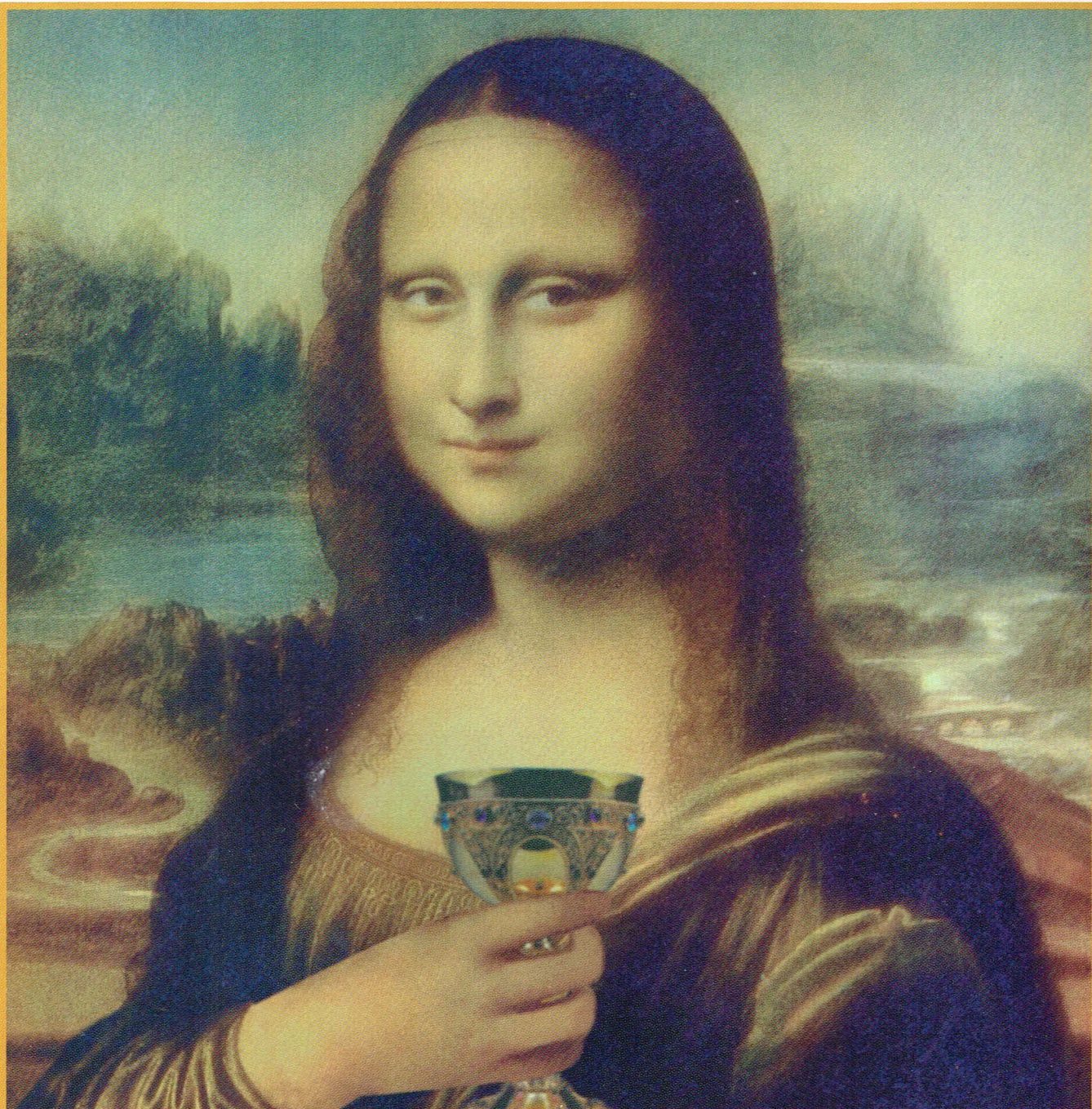
honey and water, there should be no problem. I checked with my rabbi and verified that as long as I use equipment that is either new or made kosher for Passover and the ingredients are certified as kosher for Passover, the mead would be kosher for Passover. There are only two main ingredients in mead that would cause any concern, honey and yeast. Honey is not a problem, and Red Star wine yeast is certified as kosher for Passover. I used Red Star's Champagne yeast.

Making equipment kosher for Passover is part cleanliness and sanitation and part tradition. For me it was pretty easy. Since I made the mead during the holiday, my kitchen was all set. I used a pot and utensils that are only used for Passover. Bottles and the fermenter presented a bit of a problem though. There had been beer in the bottles and wine that was not kosher for Passover in the one-gallon jugs that I used for fermenting vessels. Definitely not acceptable. As per instructions from my rabbi, after the offending bottles were cleaned and sterilized, I put them in boiling water to purge any trace of the original contents. I also replaced old siphon hoses and racking canes that probably should have been tossed out long ago anyway.

Last year I started a new tradition that allows me to merge three important parts of my life: my family, my religion, and my hobby. My kids helped to make a batch of kosher-for-Passover mead to drink this year. It's a tradition that I intend to continue for many years and one that I hope my children will carry on when they have families of their own.

Hag Samayach! (Have a joyous holiday!) ■

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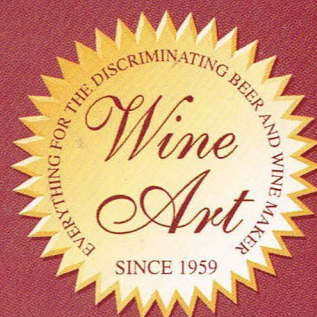
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