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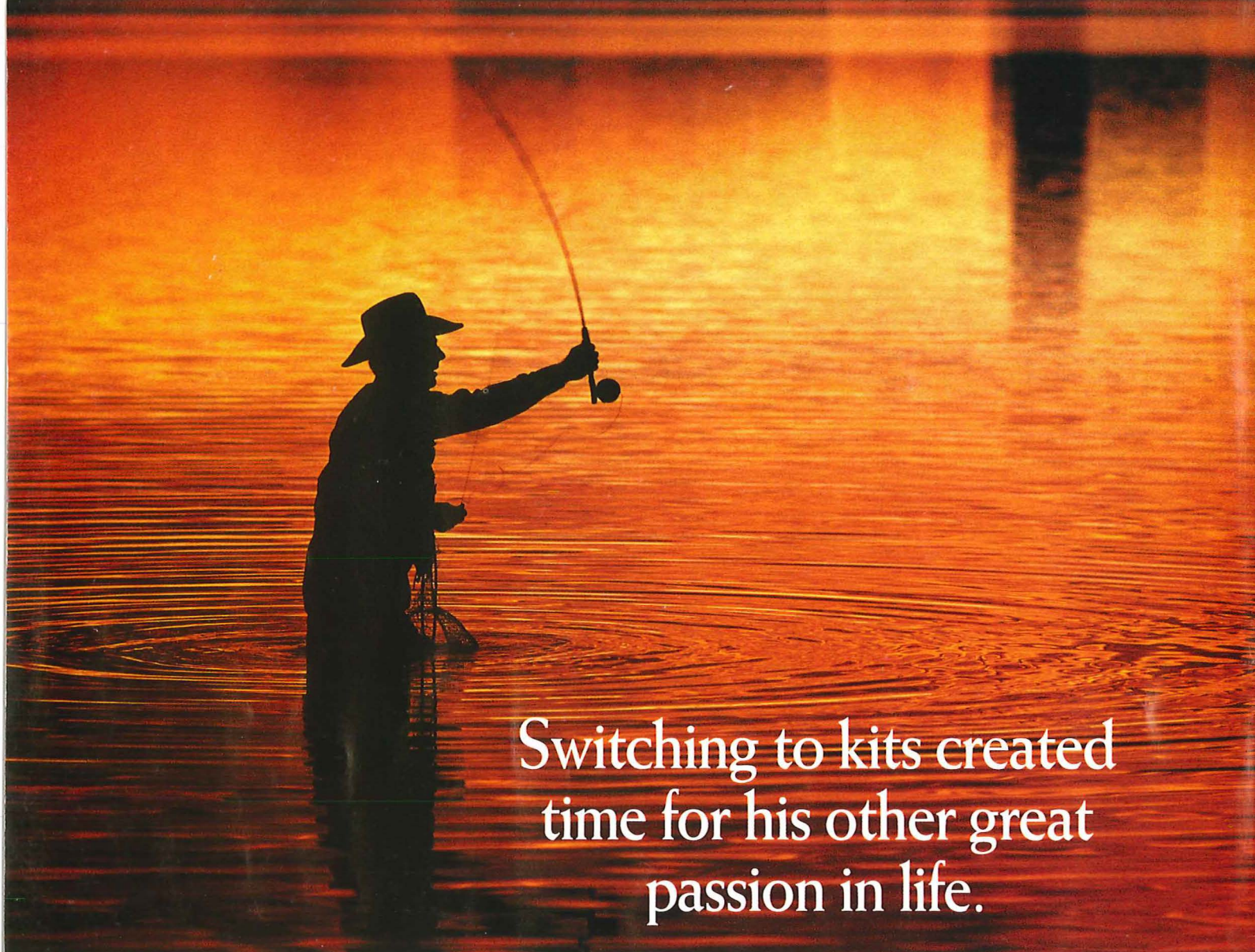


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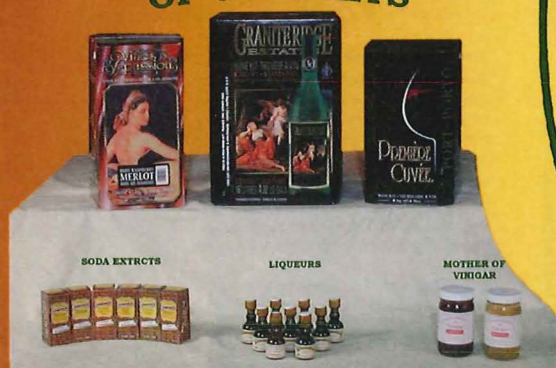


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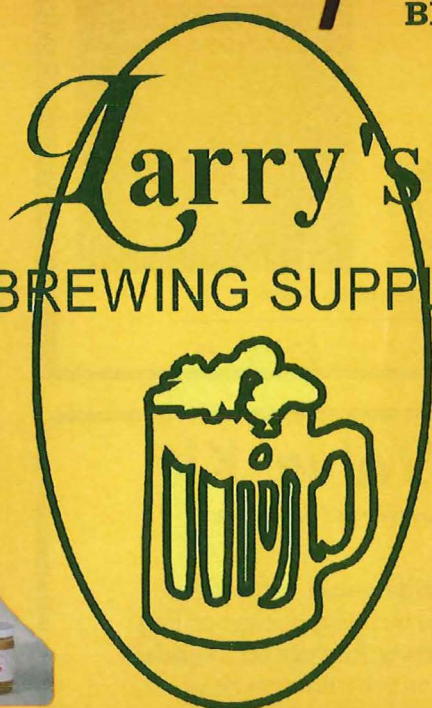


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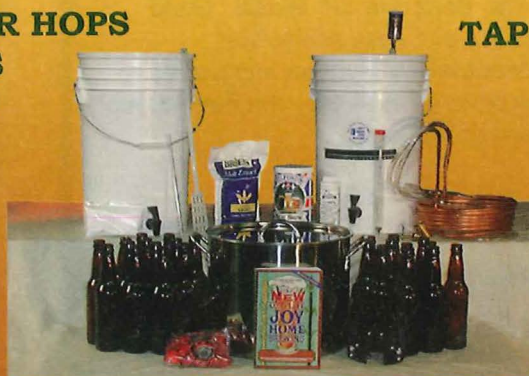


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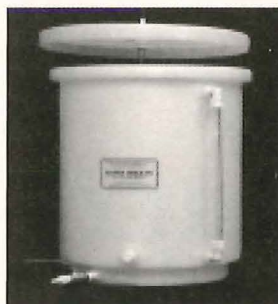


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# ZYMURGY®

*Zymurgy \zī'mar jē\ n: the art and science of fermentation, as in brewing.*

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*By Michael J. Hall, Ph.D.*

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*By Randy Mosher*

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*By Greg Kitsock*

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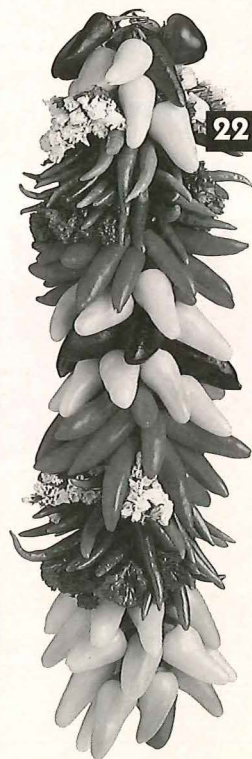
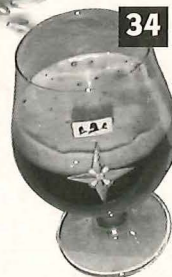
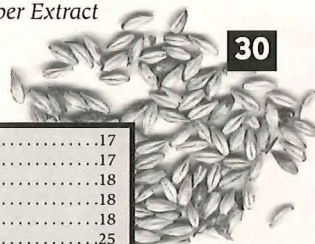
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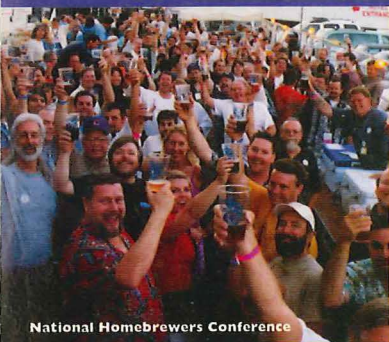
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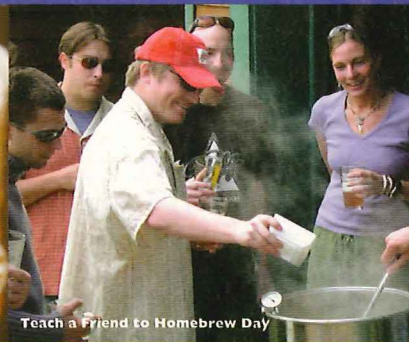
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BY PAUL GATZA

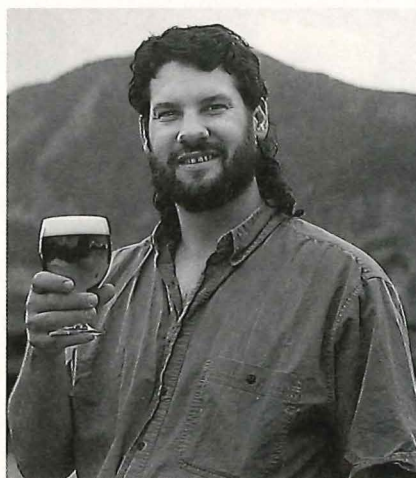
# Ask Not What Your Country Can Brew For You...

**T**he first Saturday of November (November 2 this year) will be our third annual **Teach a Friend to Homebrew Day**. This day more than any other is one of service to the hobby. I ask each American Homebrewers Association (AHA) member to find one or more friends, neighbors, relatives or strangers, introduce them to the local homebrew supply retailer, teach them the nuts and bolts of beginning brewing and show them how fun the hobby can be. This way, we can keep fresh blood coming into the hobby to replace those departing, keep ingredients turning over in homebrew supply shops—resulting in fresher ingredients overall—and create more people who make homebrew that we can sample.

Teach a Friend to Homebrew Day was created as a joint project of the AHA and the Home Wine and Beer Trade Association (HWBTA). The AHA represents the interests of the homebrewer; the HWBTA represents the homebrew supply retailer. The HWBTA underwent a change in 2001 to become an organization just for retailers rather than the whole allied trade. The result has been quite positive, allowing a clear focus of representation. The recently installed HWBTA president is Roger Savoy, owner and operator of Hennessy Homebrew Emporium and two other supply shops. Roger is a sharp businessman and I look forward to working with him to provide more unity and develop programs to create mutual benefits for homebrewers and their shops. If you are a retailer reading this, I believe the time is right to look at joining or rejoining the HWBTA.

## Annual Thanks

I would like to take this opportunity to thank some of the people and sponsors who have made extraordinary contributions to the AHA this year. My continuing vision for the AHA is to become more of a grassroots



organization—in which the direction and many of our events can involve our members with as much energy as we are willing to put into the hobby and the association.

I would like to start with all of us, AHA members, who keep homebrewing alive and well around the world. We teach others to brew, keep enthusiasm for a handcrafted tradition and generate pleasure for our friends when they have the fortune to taste our beer. We are a better, more creative, friendlier society because of us.

Next up are the AHA membership liaisons. There are 75 of you, and I don't have

the space to list you individually. Liaisons brought in more than 500 memberships this year on the local level at club meetings, beer festivals, the AHA Big Brew and other beer events. I think of our liaisons as our eyes and ears in the field, along with the AHA Board of Advisors who provide daily input to staff on programs, plans and policies. The board members are listed in the box below.

I would also like to thank our sponsors, advertisers and other allied trade people who support the AHA with money and facilities. The major sponsors include the Boston Beer Co., Sierra Nevada Brewing Co., FlavorActiV, Rogue Ales, Deschutes Brewery, Briess Malting Co., Wyeast, Quoin Industrial Inc., Coopers and Redstone Meadery.

The AHA National Homebrew Competition and club-only competitions rely on more than one thousand judges, stewards and entrants. While there are many who deserve to be singled out, I want to clink glasses with site directors Dennis Kinvig, John Tyler, Gloria Franconi, Alberta Rager, Kevin Mudd, Mark Wilson, Antoinette Hodges, Bev Blackwood, Jim Layton and Tony Stone. We would not have the world's largest annual beer competition without you. (continued on page 61)

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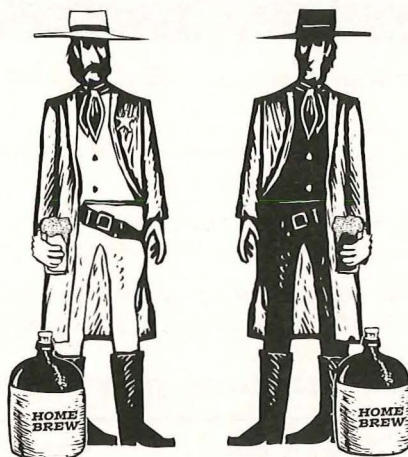
# A Texas-Style Beer Tasting Duel

The AHA National Homebrewers Conference (NHC) is always a good time—even if it does involve some late and not-always-clearly-recalled evenings. The 2002 event in Dallas was no exception. Every year I enjoy old friends and make some new ones and the hospitality suite is a great place for that. Perhaps the most welcome sight in the suite this year was to find folks cooking up *huevos rancheros* for all comers. Nothing matches the taste of chorizo, eggs and salsa inside a warm, soft flour tortilla for a beer-fatigued mouth! Yum.

I nearly always learn a few things at the NHC. Even after a diploma from the Siebel Institute and a dozen years of reading, writing and talking about brewing and beer, I still find presentations at the homebrew conference that teach me something new. In this case, I particularly enjoyed Charlie Gottenkieny's excellent talk on lambic brewing.

This year FlavorActiV added another activity for conference attendees. Using their Enthusiast Beer Taste Troubleshooting Kit, they conducted a little "taste test" for attendees. The winner was to receive a copy of the kit for their very own. The test consisted of four beers doctored with off-flavors. Participants tasted each beer and answered a multiple-choice question about its flavor. The taste test also included a multiple-choice quiz about beer flavor and beer styles. Around mid-morning on Saturday, I decided to accept the challenge.

Picking out the off-flavors in the taste test wasn't tough, but deciding exactly how to describe them could be. I recall sample number two being "musty" upon first impression, but the answer sheet offered both "musty" and "earthy" as choices. I decided that "earthy" was actually the better descriptor and wound up being correct. At least one of the other three beers offered a similar pair of closely related descriptors.



The quiz included a number of difficult factual questions such as determining the flavor threshold of diacetyl. Is it: a) 20 micrograms/liter, b) 50 micrograms/liter, c) 50 milligrams/liter or d) 1,000 milligrams/liter? Others were difficult because they were open to interpretation and therefore tricky, such as the question that asked the number of "recognized beer styles" with possible answers of: a) 23, b) 54, c) 125 and d) 254.

At noon on Saturday, FlavorActiV completed the testing and posted the results. Six tasters out of 36 participants correctly identified all four of the off-flavors. To determine the ultimate winner of the competition, results from the written portion of the test were tallied and it turned out that another homebrewer named Jim Rossi and I had tied with nine out of 10 correct. (I missed the one about the beer styles.)

To resolve the tie, the FlavorActiV guys decided that Jim and I should go *mano a mano* in a taste-off right before the conference banquet scheduled for Saturday night. When the magic hour arrived, we set up in the reception area outside the banquet, doing battle as folks streamed by to grab seats for dinner. We hunched over a

round cocktail table, surrounded by our supporters and attracting the various voyeurs who flock to any battle in hopes of feeling the buzz of victory or witnessing the sting of defeat.

Jim came to the conference with the guys from Beer, Beer and More Beer—another outfit that is making great stuff for homebrewers. (Indeed, while looking at all their gear at the conference, I gave thanks that they weren't around when I was in my obsessive/fanatical phase of brewing. I'd own a lot more gear if they had been.) The B, B and MB guys—it seemed like a dozen although it may have been just one or two—gathered around Jim. My side was bolstered by Mike Bardallis and one or two folks from Boulder who happened to be free at the moment.

The final test consisted of a single beer spiked with several off-flavors. We were to taste the beer and mark all the flavors we identified on a scoresheet that offered a menu of possible off-flavors. Where the beers in the initial challenge were spiked to six times the flavor threshold, this beer was spiked to just two times the flavor threshold. Simon Hadman from FlavorActiV briefed us and then poured the beer. Jim and I stared across the table at each other with hunger in our eyes. (It was dinner time, after all.) Then we both went for our glasses and tasted.

The first impression I got was that of . . . well, beer. I wasn't getting anything untoward in the sample. Nada, zip, nothing. I figured the final would be hard, but this was impossible. I kept tasting, hoping that something would come through so I didn't have to humiliate myself by turning in a blank score sheet. Then Jim broke the silence.

"I'm not getting anything on this, are you?" he asked me. "I think we ought to start over again with a" (continued on page 61)



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### Musings and Mash Hopping

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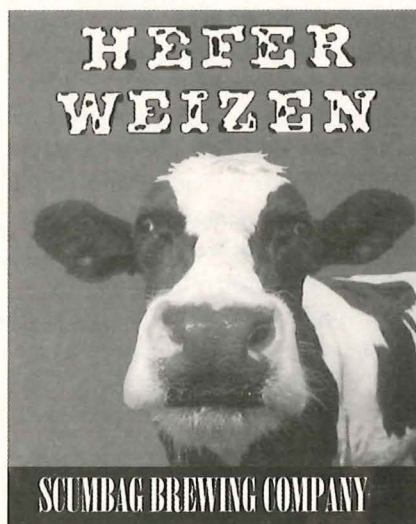
I am writing for two reasons. First, I would like to express my deepest sympathy to Laurie Fix. Dr. Fix was and continues to be my homebrew guru. It was crushing for me to learn of his passing. After reading so much of his work (10 times over), it seemed like I knew him personally. I will always miss him like a student misses that teacher who turned on the light, opened the door and made the way seem obvious! All of my zymurgistic successes are due in part to his love of beer and teaching.

Secondly, I wanted to let you know that the changes in the *Zymurgy* layout have not gone unnoticed by us silent readers/brewers. The magazine has become splashy, entertaining to the eye and stimulating to the mind—move over, *Time*. Nice job guys and gals!

I would also like to share some of my own gleanings from the hop field after reading “Unconventional Hopping for the Conventional Brewer” by Marc Sedam in the September/October *Zymurgy*.

After having spent months working in the Czech Republic in the early 90s, I developed a love for Czech Pilsener and began homebrewing upon my return to Seattle. Like many homebrewers, brewing became an obsession with me and I absorbed information like a sponge. My ultimate goal has always been to recreate Pilsener Urquell—no small feat, I might add.

Along the path to Pilsener nirvana I adopted Dr. Fix’s recommendations on first-wort hopping—in fact, all of my beers are now first-wort hopped. More recently (the last three years or so) I have been experimenting with mash hopping. After researching it, I developed a pretty good feel for mash hopping. My opinion is that there are several commercial beers, including Pilsener



Urquell, that have flavors and aromas that cannot be duplicated without mash hopping. In fact I had one Pilsener score a 40 in the first round of the 2001 NHC in the experimental beer category. After that I entered a lot of mash-hopped beers in a great many categories with almost no success.

Personally, I love mash-hopped beers. The process makes beers that are the most aromatic and uniquely flavored of any that I have tasted. I have discontinued entering mash-hopped beers in competitions, however. Of the 20 or so that I have entered, not one has been identified as having a mash-hopped flavor. Most of the beers receive comments about the great aroma but the flavor is always described as diacetyl—perhaps the closest flavor that the judges had knowledge of.

Keep up the good work and please let Ray know that many of the beer geeks in my neighborhood think that his work at *Zymurgy* is aces!

Regards,  
Bob Mitchell  
Lynnwood, Wash.

Bob,

*Wow, we love to get glowing letters! I bet the folks in design will put this one in their clip books. Thanks for noticing.*

*As for replicating the hop character of PU, do remember that the big guys get first crack at the hop crop each year and they select the very best hops for their aroma applications, so matching exactly what they achieve will be quite a challenge. Nonetheless, we can make world class beer at home that is every bit as good as the best commercial beer—just remember to take credit for what you have achieved rather than fretting that it's not exactly like the commercial original.*

*Cheers,  
—Ed.*

### Flying Foam in a British Pub

Dear *Zymurgy*:

Ray Daniels' July/August column on the sins of beer serving reminded me of an incident some years back. We were in a pub in the center of Wells, in Somerset. It was a somewhat touristy place, yet still a proper pub. I watched an older, well-dressed fellow order a pint and be served a glass with a surprisingly large head.

In the southwest of England one expects little foam—if any—on cask ale. The gentleman scowled a bit, took a good breath, blew the foam from the glass onto the bar and sternly handed his glass back to the publican. The publican did not scowl back, but rather looked a bit embarrassed. He took the glass, topped it up to its proper measure, handed it back to the customer with a comment, “New keg just on, a bit gassy yet,” and swabbed the foam off the bar top. The customer was thus mollified; I couldn't tell if he actually said anything but the look said, “Right, then.”

The English are still very polite overall, but don't mess with their pint.



Sincerely,  
Dick Dunn  
Longmont, Colo.

Dear Dick:

*Thanks for that nice story. English pubs often display a lot of character. And sometimes the character gets up and walks out after a pint or two. Here's to a full pint, no matter where your drink is poured!*

—Ed.

### In This Case, More is Less

Dear Zymurgy:

In the "For Geeks Only" section of the July/August 2002 *Zymurgy*, Chris Bible writes about immersion chiller performance. Overall, the article was very well written, but I have a comment to make about the technical content. I am a Ph.D. (or will be in about four months) in mechanical engineering specializing in heat transfer, so maybe I read the article a little too closely. I enjoyed it immensely!

The article lists six factors that affect the rate at which heat is removed from the hot wort during cooling, the fourth of which was the rate at which cooling water flows through the chiller. While this is definitely true, Chris says, "The water-flow velocity influences the coil's cooling efficiency as well. At higher cooling-water flow rates, the water has less time to heat up as it travels through the coil, so it does not remove as much heat as when it moves slowly. Colder coil and hotter wort (larger temperature difference) equals faster cooling." Part of this statement is not true, as higher flow rates equal faster cooling of the wort.

The amount of heat transferred from the wort to the coils is determined by the temperature difference and overall heat transfer coefficient of the coil, which includes convection from the hot wort to the coil, conduction through the wall of the coil, and convection from the inside coil wall to the cold cooling-water. The temperature change of the cooling-water for a given amount of heat transferred from the inside wall of the coil is governed by:

$$Q = mC_pDT$$

where  $m$  is the mass flow rate of the cooling-water,  $C_p$  is the specific heat of the cooling

water and  $DT$  is the temperature change of the cooling water at a given point.

At higher flow rates, the temperature difference between the inlet and outlet of the cooling-water flow will be lower than if the water was moving slower, but this does not mean less heat is transferred, only less heat per unit mass flow rate of cooling water. In fact, higher flow rates increase the amount of heat transferred in two ways. The first is that the higher flow rate increases the internal convective heat transfer coefficient. The second is that the higher the cooling water flow rates, the cooler the whole length of the coil will be, since less heat has been transferred to the cooling flow per unit of mass flow, providing a larger temperature difference between the cooling-water and the hot wort over the whole length of the coil.

The suggestion here would be that you would use high flow rates of cooling water early in the immersion chilling process and as the wort cools down and the temperature difference between the wort and the cooling-water inlet gets smaller, one would slow the flow rate down to conserve water, since at this point heat transfer is low anyway.

Just thought I'd throw my two cents in. I resisted writing for a while, but my "engineering side" finally got the better of me. Keep up the good work, but higher (sic) better engineers (just kidding Chris!)

Sincerely,  
Andrew C. Nix  
Research Associate  
Department of Mechanical Engineering  
Virginia Tech

Andrew:

*So in fast-moving water, each gallon of water picks up less heat, but because more gallons flow through the system, heat is removed more quickly. Thus higher flow equals faster chilling, a conclusion which our physical chemistry prof would have called "intuitively obvious."*

*If Zymurgy could afford to hire engineers, we'd have to find one who could not only understand the science, but also write clearly to boot. (We have editors to worry about things like spelling.)*

*Thanks for the letter.*

—Ed.

### Echoing Papazian, 'azian, 'azian . . .

Dear Zymurgy:

In the September/October *Zymurgy*, Charlie Papazian's World of Worts piece includes two recipes: "Born in the USA German Pale Ale" and "Embracing Sunset Amber Lager." While I initially thought that this second recipe was a great bonus, it also sounded strangely familiar. Turns out this is the same recipe that ran in Charlie's column in the previous issue.

What's going on?

An eagle-eyed reader  
Longmont, Colo.

Dear Eagle Eyes:

*Whoops! Somewhere along the line we pasted without first cutting adequately thus leading to an instant replay on the amber lager. Look for it again in this issue if we are a little short on copy and need to fill in a bit more space. (Just kidding!)*

—Ed.

### Anything Brewing with Noonan's Book?

Dear Zymurgy:

I don't know if you can answer this, but is a new edition of Greg Noonan's *New Brewing Lager Beer* in the works or is it just out of print for good? I've been trying to find a copy to buy without much success.


Thanks,  
Chuck Brandt  
Pittsburgh, Pa.

Dear Chuck:

*Actually, neither. We checked with our sister division, Brewers Publications, to find that while Noonan's classic text has been out of stock for almost a year now, reprint plans are afoot. Look for it to arrive in the market in early spring 2003.*

—Ed.

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Send your homebrewing questions to "Dear Zymurgy," PO Box 1679, Boulder, CO 80306-1679; FAX (303) 447-2825 or professor@aob.org. Hey homebrewers! If you have a homebrew label that you would like to see in our magazine send it to: Dave Harford, Magazine Art Director, The Association of Brewers, 736 Pearl Street, Boulder, CO 80302 or E-mail it to: harford@aob.org. 



BY GARY GLASS

# Club Finds Better Brew Through Judging

Anyone who has ever run a good-sized homebrew competition knows that one of the hardest tasks is to find enough qualified judges. As the number and size of homebrew competitions has risen over the last few years, the need for more judges has grown as well. The AHA's National Homebrew Competition (NHC) attracted 3,074 entries this year, making it by far the world's largest. Without question, the biggest challenge facing the NHC has been ensuring that we have enough experienced individuals to adequately judge all of the entries. Thankfully, our regional organizers have done a fantastic job of rounding up enough judges to get the job done—though it hasn't been easy.

Given the demand for judges, my ears perked up upon hearing about the success of the Denver-area Foam on the Range (FOTR) club in recruiting new Beer Judge Certification Program (BJCP) judges from among their ranks. Last year Foam on the Range hosted a BJCP exam where the seven club members taking the exam passed, bringing the club's total number of certified judges to nine. This year, they are hosting another exam and look to add another seven certified judges to the club, which will bring the total to 16 if they all pass—impressive for a 44-member club.

I decided that I had to find out the secret of their success so that I could pass it on to all the other clubs out there. I dropped in on the Foam on the Range picnic (more on that later) and posed the question to Jon Douglas and Tom Kosinski. Jon explained that a couple of years ago, the members of the club decided they really wanted the club to be a brewing club and not just an excuse to gather to drink beer. Several club members thought studying for the BJCP exam would be a good way to improve their brewing knowledge. "Although we were all good brewers previously," Jon told me, "studying for the exam made us even better."



Judges evaluating competition samples

Club member and brewer extraordinaire Jim Edgins, a BJCP judge since the early 1990s, led the club's training. Closely following the study guide available from the BJCP Web site ([www.bjcp.org](http://www.bjcp.org)), the future judges went through 10 study sessions and additional review classes held every other week to prepare for the exam. Each session focused on certain style categories, ingredients and brewing processes. At the meetings, one of the participants brought in classic examples of the style being discussed and gave a talk on the history, brewing techniques and characteristics of the style—thus the success of the classes was dependent upon the contribution of each of the participating club members.

If your club is looking to set up its own BJCP exam, you will need to contact the BJCP exam director for your area (either East or West). Exams require at least five participating examinees. The exam administrator

## 2002-2003 Homebrew Club of the Year Standings

Points	Club
12	James River Homebrewers
8	Fellowship of Oklahoma Ale Makers
4	Kansas City Bier Meisters

## Fruits and Veggies AHA Club-Only Competition

The November/December AHA Club-Only Competition is Fruits and Veggies. The competition is hosted by Hogtown Brewers.

The style for the competition is Fruit Beer and Spice/Herb/Vegetable Beer, BJCP Categories 21 and 22. One entry of two bottles is accepted per AHA registered homebrew club. Entries require a \$5 check made out to AHA, an entry/recipe form and bottle I.D. forms. More information on the club-only competitions and forms are available at [www.beertown.org/AHA/Clubs/clubcomp.htm](http://www.beertown.org/AHA/Clubs/clubcomp.htm)

Please send your entry to:

**Hogtown Brewers AHA COC**  
c/o Wayne Smith  
5327 CR 346 E  
Micanopy, FL 32667

Entries are due by Monday, Dec. 2, 2002. Judging is slated for Saturday, Dec. 7, 2002. Go to <http://hbd.org/hogtown/> for on-line registration. E-mail Dave Perez at [perez@gator.net](mailto:perez@gator.net) for additional information.



## From Our Readers



PHOTO COURTESY OF CURT HAUSAM

**Double, double, toil and trouble: AHA member Curt Hausam's homebrewing setup in Salem, Ore.**

## Upcoming 2002-2003 AHA Club-Only Competition Styles

Month	Style or Name	Cat.#	Host
Nov/Dec	Fruits & Veggies	21, 22	Hogtown Brewers
Jan/Feb	Bitter & English Pale Ale	4	Minnesota Timberworts
Mar/Apr	Brown Ale	10	Prairie Homebrewing Companions
May	English & Scottish Strong Ale	11	Rillito Creek brew Club

should be a national or master ranked BJCP judge, although exceptions can be made at the discretion of the BJCP exam director. The exam itself consists of 10 essay questions and four beers to be evaluated. Exam fees are \$50 for first-time test takers and \$30 for those retaking the exam. The BJCP

Web site has more information on setting up exams.

Participating in homebrew competitions, whether as a judge or a steward, is not only a lot of fun, but also is a great way to get to know homebrewers from other clubs in your area. In addition, the process

of evaluating beer will inevitably help advance your own understanding of beer and brewing. Of course entering your beers in competitions will provide you with valuable feedback that will improve your brewing, and might even earn you a ribbon for your brewery wall.

OK, so the Foam on the Range club does more than just crank out judges. As I said earlier I made it down to their annual picnic, or "Pignic" as they call it, in August. With more than 125 people attending, it was a pretty impressive turnout. Pignic goers were treated to 100 pounds of delicious smoked pork and brisket provided by Breckenridge Brewery, and salads and desserts brought potluck style. Of course there was plenty of homebrewed beer and soda as well. The really great thing about the whole event—well, other than the tasty beverages and the friendly company—was that the whole thing was free.

The Pignic also serves as the club's major fundraiser. Now I know what you're thinking: "You just said it was free, how could it be a fundraiser?" This year FOTR managed to get more than 100 sponsors for the event, donating everything from sacks of grain to a conical fermenter for a silent auction. After paying for the meat, the club walked away with close to \$450. In addition, all of the club members present won some type of raffle prize, including T-shirts, books and brewing ingredients. When I asked Jon what the secret was to getting so many sponsors, he replied, "No secret, just a helluva lot of work." Actually, it involves about two weeks of solid work building a database of potential sponsors and then contacting them all. Throughout the year the club members repay the favor by supporting the businesses that sponsor the picnic.

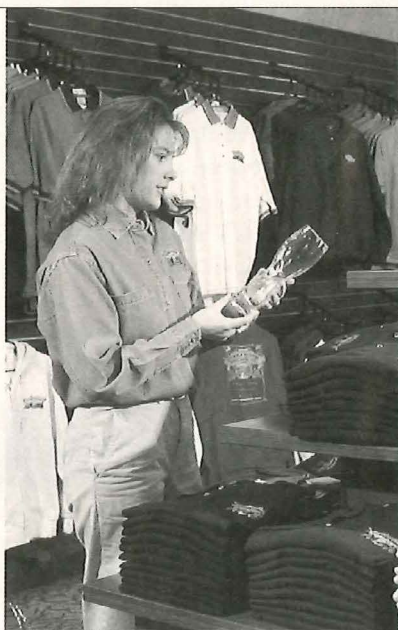
Another note on Foam on the Range: they will host the first ever TechTalk homebrew competition coming up in February 2003. The idea for the competition was spawned from a discussion on the AHA's TechTalk homebrewers' e-mail forum. The competition will cover categories 6A-C (American Pale Ales) and 10D (American Brown Ale) of the BJCP style guidelines, and is open to AHA members only. For more information on the competition, check out TechTalk. AHA members can sign up for (*continued on page 62*)



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To become an AHA sponsor simply fill out the form and fax it back to 303-447-2825 or call membership services at 303-447-0816 or visit [www.beertown.org](http://www.beertown.org). Thank you for considering sponsorship of the American Homebrewers Association.

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*Paul Gatz*

Paul Gatz

Director, American Homebrewers Association

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John Thorngren	Brighton	CO	Arnold L. Peterson	Wilmington	MA	Brewbonk Plague-Vince Conway	Buffalo	NY
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Andrea Weston	Boulder	CO	Seth Schneider	Westport	MA	Brendan Brady	Canandaigua	NY
Steven Willey	Parker	CO	Chet Swanson	Boston	MA	Calvin Chiang	Penfield	NY
Ronald Winter	Colorado Springs	CO	William Walsh	Manchester	MA	Craig William Davis	Marcy	NY
Brian S. Zimmerman	Denver	CO	Warren Weatherbee	Lancaster	MA	Bruce & Gloria Franconi	Red Hook	NY
Fred Bailey	Windsor	CT	Kurt Wollenberg	Allston	MA	Roger Haggert	Endicott	NY
Mac Brighton	Nonwalk	CT	Biermeister Brewers Club	Severn	MD	Joseph Loacono	New York	NY
Dennis Durham	Higamum	CT	Thomas Bergman	Jefferson	MD	Charles Lutz	Walden	NY
Phil Kuepper	Stamford	CT	Robert P. Bouthner	Forest Hill	MD	Robert J. May	Huntington	NY
Paul McClure	Uncasville	CT	Ralph Bucca	Huntingtown	MD	Dan McLaughlin	Bohemia	NY
Peter Reid	Nonwalk	CT	John W. Epps	Mitchellville	MD	Stephan Miller	Sprakers	NY
Richard Rosen	Andover	CT	Russell Erb	Rockville	MD	Raymond Murphy	Medford	NY
Lowell D. Yeager	Canterbury	CT	Bob Farina	Rockville	MD	Angel Nardone	Rochester	NY
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Daniel Carey	New Glarus	WI
C. L. Chamberlain	Pewaukee	WI
Lee Damkoehler	Oconto	WI
Dennis Davison	Greenfield	WI
Catherine Faust	Elm Grove	WI
Chuck Goluque	Abraham	WI
Gary Luther	Hardland	WI
Jeff Parks	Manitowoc	WI
Joseph Schipper	Viroqua	WI
Tim Schlepper	Fitchburg	WI
Mike Simon	St Atkinson	WI
Eric D. Steele	Milwaukee	WI
Chris Sulkowski	East Troy	WI
Charlie Thompson	Menomonee Falls	WI
Cynthia Volke	Thiensville	WI
Bill & Cathy Barrington	Cheyenne	WY
Stephen Boss	Laramie	WY



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## OCTOBER

**26 2002 Queen of Beer Competition.** Placerville, CA. Open to women only. BJCP SCP. The Hangtown Association of Zymurgy Enthusiasts (H.A.Z.E.) proudly announces the return of this popular competition! Get your female members to brew that award-winning entry AND encourage other women to brew (maybe plan an all-women's team brew). Please pass this information on to any/all women brewers that you know—announce this at your next club meeting! Contact: QOB 2002 Committee. E-mail: QOB-2002@hotmail.com URL: www.hazeclub.org

**26 Spooky Brew Review,** Chicago, IL. Annual Chicago Beer Society homebrew competition of the good, the bad and the ugly. Includes "Spookiest" beer as well as traditional BJCP categories. Fee: \$7 for first, \$5 for additional. Contact: Steve Hamburg 773-878-0177. URL: www.chibeer.org/spooky02.html

**27 Lincoln Lagers vs Omahops,** Omaha, NE. BJCP SCP. Contact: Elliott Spiker. Phone: 402-636-2233, 402-496-4717. E-mail: espiker@oppd.com

**28 - Nov 8 Strong Ale Homebrew Competition.** San Diego, CA. A Strong beer, mead and cider competition where all entries must have an OG of 1.080 or higher. Sponsoring club: Quality Ale and Fermentation Fraternity (QUAFF). Deadline: 11/8/02. Fee: \$6. Awards ceremony: 11/26/02. Contact: Richard K. McLaughlin. Phone: 619-280-5855. E-mail: richardmcl@cox.net

## NOVEMBER

**2 4th Annual AHA Teach A Friend To Homebrew Day.** Anywhere You Happen to Be. For the fourth straight year, the American Homebrewers Association brings you Teach A Friend To Homebrew—a day of fun and service for the homebrewing community. Find that friend or family member trapped in a boring, non-brewing existence and show them the way to the exciting and fulfilling world of homebrewing! Contact: Gary Glass. Phone: 888-822-6273, 303-447-0816 x 121. E-mail: gary@aob.org URL: www.beertown.org/AHA/

**2 Novembeerfest.** Kent, WA. Sponsoring club: Brews Brothers. Deadline: 10/6-10/26. Fee: \$5. Contact: Jim Hinken. Phone: 425-483-9324. E-mail: brews.brothers@verizon.net URL: www.brews.brothers.org

**8 2002 WineMaker International Amateur Wine Competition.** WineMaker Magazine. The best homemade wines from across North America and around the world will compete for gold, silver and bronze medals in 51 categories awarded by a panel of experienced wine judges. Enter your wines and compete against the continent's best home winemakers! You can gain international recognition for your winemaking skills and get valuable feedback from the judging panel. Entry deadline: 11/8. URL: www.winemakermag.com/feature/195.html

**8-9 Orchid Isle Ales Holiday Bash and Homebrew Competition.** Hilo, HI. 2nd annual competition. Sponsored by the Orchid Isle Ales. Enter any of the BJCP styles (Beer Judge Certification Program Guide to Beer Styles 1999). Deadline: 10/23-11/6. Fee: \$5. Awards ceremony: 11/9. Contact: Bob Culnan. Phone: 808-964-5267. E-mail: culnanr001@hawaii.rr.com

**8-9 Planet Buzz! Mead, Cider and Perry Festival.** Chicago, IL. Exhibition of commercial products, speakers, beekeeping demonstration, meadmaker's lounge. Contact: 800-229-1832. URL: www.meadfest.com.

## DECEMBER

**7 AHA Fruits & Veggies Club-Only Competition,** Gainesville, FL. AHA/BJCP SCP. Open to all AHA Registered Clubs, 1 entry per club. Style is Categories 21 Fruit Beer and 22 Spice/Herb/Vegetable Beer. Sponsoring Club: Hogtown Brewers of Gainesville, FL. Deadline: 12/02. Fees: \$5. Contact: Dave Perez. Phone: 352-337-0559. Email: perez@gator.net URL: www.beertown.org/AHA/Clubs/clubcomp.htm

## AMERICAN HOMEBREWERS ASSOCIATION • KUDOS • SANCTIONED COMPETITION PROGRAM BEST OF SHOW

### FEBRUARY 2002

Peach State Brew-off, 197 entries—**Craig Sikes** of Cumming, GA.  
War of the Worts, 255 entries—**Joseph Pfahler** of Telford, PA.

### APRIL 2002

Snowgoose/Sleeping Lady 2002 Breakup Homebrew Competition, 18 entries—**Mark Ryan** of Anchorage, AK.

### MAY 2002

20th Annual Oregon Homebrew Festival, 215 entries—**Mitch Scheele** of Albany, OR.  
Greater Montreal Homebrew Competition, 56 entries—**Karl Lerbscher** of Montreal, QC.

### JUNE 2002

Mother Lode Fair Homebrew Competition, 31 entries—**Peter Smith** of Sonora, CA.  
O.C. Fair Homebrew, 147 entries—**Jeff Toland** of San Juan, CA.

### JULY 2002

Amador County Fair, 101 entries—**Bud Tourville** of Rocklin, CA.  
Buckeye Brewer of the Year, 45 entries—**Cas Koralewski** of Toledo, OH.  
E.T. Barnette Homebrew Competition, 67 entries—**Jason Ditsworth** of Anchorage, AK.  
Iowa State Fair Amateur Oenology, 178 entries—**Robert Spina** of Cedar Rapids, IA.  
Ohio State Fair Homebrew Competition, 132 entries—**Brian St. Clair** of Cincinnati, OH.  
Small Brewers Festival of California, 84 entries—**Kent Wheat** of San Jose, CA.

### AUGUST 2002

Alaska State Fair, 156 entries—**Chris Anderson** of Anchorage, AK.  
Foam Cup 2002, 147 entries—**John Karmazin** of Claremore, OK.  
Third Annual N.Y. State Fair Homebrew Competition, 174 entries—**Peter Garofalo** of Syracuse, NY.

**AHA SCP** = American Homebrewers Association Sanctioned Competition Program. BJCP = Beer Judge Certification Program. The Calendar of Events is updated weekly and is available from the Association of Brewers: [info@aob.org](mailto:info@aob.org) or [www.beertown.org](http://www.beertown.org) on the Web. To list events, send information to **Zymurgy Calendar of Events**. To be listed in the January/February Issue (Vol. 26, No. 1), information must be received by November 4, 2002. Competition organizers wishing to apply for AHA Sanctioning must do so at least two months prior to the event. Contact Kate Porter at [kate@aob.org](mailto:kate@aob.org); (303) 447-0816 ext. 123; FAX (303) 447-2825; PO Box 1679, Boulder, CO 80306-1679.

**30 - Jan 11 8th Annual Big Bend Brew-Off.** Tallahassee, FL. This one-day competition is for all categories of beer, mead and cider. Sponsoring club: North Florida Brewers League. Deadline: 1/11/03. Fees: \$6. Awards ceremony: 1/18/03. Contact: Larry Agee. Phone: 850-576-0540. E-mail: la2532@aol.com URL: www.nfbf.org

## JANUARY

**3-21 Meadlennium 2003.** Orlando, FL. Sponsored by Central Florida Home Brewers, this competition is one of the only mead-only competitions in the USA. Deadline: 1/3/03-1/21/03. Fee: \$6. Awards ceremony: 2/2/03. Contact: Ron Bach. Phone: 407-696-2738, 407-262-7422 x 7043. E-mail: bachian@juno.com URL: www.cfhb.org

## FEBRUARY

**14-28 Bluebonnet Brew-off.** Irving, TX. Sponsored by Cowtown Capers, NET Hoppers, Knights of the Brown Bottle, North Texas Homebrewers Association and Red River Brewers. Deadline: 2/14/03-2/28/03. Fee: \$7-9. Awards ceremony: 3/21/03-3/22/03. Contact: Mark A. Wedge. Phone: 817-938-8400, 817-381-2915. E-mail: markwedge@yahoo.com URL: www.bluebonnetbrewoff.com

**26-March 1 Real Ale Festival.** Chicago, IL. Largest exhibition of cask conditioned ales anywhere outside of Britain plus homebrewed real ale competition and much more. Contact: 773-665-1300. URL: [www.realalefestival.com](http://www.realalefestival.com).



BY JIM LARSEN

# OmaHops Brew-up: Munton's Amber Extract Recipes

**O**maHops was founded in July 1993 in Omaha, Neb. We originally met monthly at Fermenters Supply, the local homebrew supply shop. These days our monthly meetings are in members' homes, at local pubs, in a park, or occasionally back at Fermenters Supply. Our biggest annual events are the Nebraska Craft Brewers' Festival (in which we work with brewpubs and micros in the state) and the Big Brew on National Homebrew Day (we brew a single 85-gallon batch of beer). Photos of our annual brew event can be seen at <http://communitylink.discoveromaha.com/groups/OmaHops>.

To perform this Extract Experiment, we were provided with two cases (12 3.3-pound cans) of Munton's Amber Malt Extract. Other ingredients were purchased through Fermenters Supply.

Here is a brief introduction of the brewers who participated in this project.

Wayne Simerly, club events coordinator, has been brewing since 1998. He currently uses a three-tier, 10-gallon system to brew six to 10 batches a year. He is a BJCP-recognized judge.

Frank Sobetski, Jr., vice president, began brewing in 1980. He has administered the Nebraska State Fair beer and wine judging since 1983. As a BJCP certified judge, he judges at the Nebraska, Iowa and Wisconsin state fairs. Frank also owns Fermenters Supply.

Elliott Spilker, president, has been homebrewing for 13 years and is a self-proclaimed extract expert. He is a BJCP certified judge and has been a member of OmaHops since 1993.

Mike Sanford, longtime member and former club secretary, is responsible for the club's 85-gallon batches. He rigged three 100K+ BTU propane burners under his 100-gallon stainless steel kettle. It is a sight to behold.



**Members of the OmahaHops Homebrew Club standing from left to right: Jim Larsen, Steve Ortner, Sam Deel, John Fahrner, Marc Pullum, Mike Sanford (host and owner of the kettle), Jeff Stonacek, Dave McGrath, Elliott Spilker, Jon Bloomquist. Hunkering down in front: Tom Hawk and Wayne Simerly. Perched on the ladder: Ritch Wagner.**

Steve Ortner is a new member of the club. He's been brewing two years and prefers brewing lagers. He recently upgraded to a half-barrel kettle.

John Fahrner, treasurer, has been a club member for five years and a homebrewer since 1986. He is a recognized BJCP judge and was named National Homebrewer of the Year in 1996.

## Elliott Spilker's American Amber

### Ingredients for 5 U.S. gal (19 L)

- 6.6 lb (3 kg) Munton's Amber Extract
- 2.0 oz (28 g) Amarillo, 8.3% AA (60 min)
- 1.0 oz (14 g) Cascade 5.8% AA (15 min)
- 1.0 oz (14 g) Cascade 5.8% AA (5 min)
- 0.5 oz (14 g) Cascade 5.8% AA dry hop
- 1.0 tsp (5 ml) Irish moss @ 15 min boil
- 11.5 g (0.4 oz) EDME dry yeast
  - O.G.: 1.047 (11.6° P)
  - F.G.: 1.010 (2.5° P)

## Brewer's Specifics

Dissolved extract in 4 gallons RO with 3 teaspoons gypsum, 1 teaspoon (5 ml) calcium chloride, 1 teaspoon (5 ml) Epsom salts, 1 teaspoon (5 ml) calcium carbonate and a pinch of salt. Topped off in fermenter to 5 gallons. Bottled with three Prime Tabs per bottle.

## Tasters' Impressions

Amber color perfect for style. Too much bitterness for style. In competitions, the beer scored consistently in the high 20s. Its major fault: It did not meet style because it was over-hopped. It would have been better entered as an American pale ale.

## Steve Ortner's Tallyman Dubbel

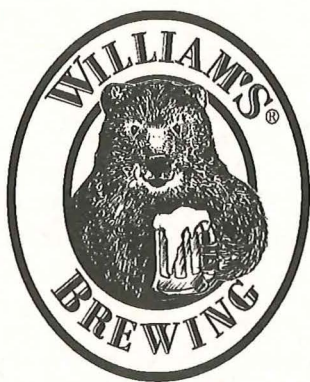
### Ingredients for 5 U.S. gal (19 L)

- 6.6 lb (3 kg) Munton's Amber Extract
- 1.0 lb (0.45 kg) Amber Candi Sugar
- 3.0 lb (1.36 kg) German Pilsner Malt
- 1.0 lb (0.45 kg) Belgian Caravienne
- 8.0 oz (0.23 kg) Belgian Special B
- 1.0 oz (27 g) Styrian Goldings 5.5% AA (60 min)
- 0.5 oz (13 g) Saaz 3.8% AA (15 min)
- 0.5 oz (13 g) Saaz 3.8% AA at knockout
- 0.125 oz (3 g) bitter orange peel at knockout
- Wyeast 1214 Belgian Ale 1 quart starter
- 0.25 tsp (1.3 g) calcium chloride
  - O.G.: 1.080 (19.5° P)
  - F.G.: 1.010 (2.5° P)

## Brewer's Specifics

Mashed all grains at 154° F (68° C) for 60 minutes with the calcium chloride. Sparged and added wort to kettle with extract, sugar and additional water. Boiled wort for 60 minutes down to 5.5 gallons (21 L). Immersion chilled and oxygenated with





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stainless steel stone for 90 seconds.

### Primary Fermentation

26 days at 73° F (22.5° C) in glass

### Secondary Fermentation

14 days at 68° F (20° C) in glass

Bottled with 0.75 cup (177 ml) corn sugar.

### Tasters' Impressions

Dark amber color. Big banana nose and good Belgian flavor. Age should mellow the banana aroma.

### Wayne Simerly's Mildly Mild

#### Ingredients for 5 U.S. gal (19 L)

- 3.3 lb (1.5 kg) Munton's Amber Extract
- 1.81 lb (0.82 kg) British Pale Malt
- 7.0 oz (200 g) Belgian Aromatic
- 4.0 oz (60 g) American Crystal 60 L
- 11.0 oz (310 g) American Crystal 120 L
- 1.0 oz (30 g) Belgian Special B
- 5.0 oz (140 g) American Chocolate
- 0.5 oz (14 g) Fuggles 5% AA (60 min)
- 0.25 oz (3.5 g) Kent Goldings 5% AA (60 min)
- 0.1 oz (2.8 g) Northern Brewer 7.7% AA (60 min)
- 0.1 oz (2.8 g) Kent Goldings 5% AA (1 min)
- 1.0 tsp (5 ml) Irish moss @ 15 min boil
- Wyeast 1968 London ESB Ale
- 750 ml starter

- O.G.: 1.038 (9.5° P)
- F.G.: 1.010 (2.5° P)

### Brewer's Specifics

Mashed all grains at 154° F (68° C) for 90

minutes. Sparged and added wort to kettle with extract and additional water. Boiled wort for 60 minutes down to 5.5 gallons (21 L). Immersion chilled and aerated well. Water was 50 percent RO and 50 percent Omaha tap.

### Primary Fermentation

7 days at 64-67° F (18-20° C) in glass

### Secondary Fermentation

14 days at 64-67° F (18-20° C) in glass

Bottled with 0.5 cup corn sugar.

### Tasters' Impressions

Very dark amber in color. Smooth malty flavor. A lot of character for a mild. Very nice beer. This beer won second place at the Iowa Brewers Union.

### Mike Sanford's Zstrong Old Ale

#### Ingredients for 10 U.S. gal (38 L)

- 9.9 lb (4.5 kg) Munton's Amber Extract
- 8.0 lb (3.6 kg) Belgian Pale Malt
- 6.0 lb (2.7 kg) Northwestern Amber Extract
- 1.5 lb (.68 kg) Munton's Extra light DME
- 1.0 lb (0.45 kg) Crystal 60 L
- 1.0 lb (0.45 kg) Aromatic
- 2.0 oz (56 g) Kent Goldings 5.4% AA (150 min)
- 2.0 oz (56 g) Hallertau 4% AA (60 min)
- 2.0 oz (56 g) Willamette 4.6% AA (15 min)
- 2.0 oz (56 g) Willamette 4.6% AA (5 min)
- 1 tsp (5 ml) Irish moss @ 15 min boil
- Wyeast 1028 London Ale for half the batch

Wyeast 1007 German Ale for the other half

- O.G.: 1.089 (21.8° P)
- F.G.: 1.029 (7.4° P)

### Brewer's Specifics

Mashed all grains at 156° F (69° C) for 75 minutes. Sparged and added wort to kettle with extract and additional water. Boiled 13 gallons wort for 150 minutes down to 11 gallons (42 L). Counter-flow chilled. Racked into two fermenters and pitched yeast.

### Primary Fermentation

28 days at 71.5° F (22° C) in glass

Kegged and force carbonated.

### Tasters' Impressions

(For 1007 batch) Smooth, rich old ale. Dark brown color. Sweet malty flavor up front, then a dry malty finish. Hop presence only to balance.

### John Fahrner's Blenheim Bitter

#### Ingredients for 5 U.S. gal (19 L)

- 3.3 lb (1.5 kg) Munton's Amber Extract
- 1.75 lb (0.8 kg) British Pale Malt
- 1 oz (28 g) Kent Goldings 5% AA (55 min)
- 0.5 oz (14 g) Styrian Goldings 5% AA (10 min)
- 1 tsp (5 ml) Irish moss @ 15 min boil
- Wyeast 1028 London Ale 1 qt starter

- O.G.: 1.035 (8.8° P)
- F.G.: 1.008 (2.0° P)

### Brewer's Specifics

Mashed all grains at 160° F (65° C) for 60 minutes (with 0.5 teaspoon (2.5 ml) gypsum in mash). Sparged and added wort to kettle with extract and additional water. Boiled wort for 60 minutes down to 5.5 gallons (21 L). Counter-flow chilled. Apparent Attenuation: 68.75 percent.

### Primary Fermentation

28 days at 65° F (19° C) in glass

Bottled with 1 teaspoon (5 ml) corn sugar per bottle. (continued on page 61)



### Not Out of the Woods Yet

Dear Beer Gurus,

My birthday is coming up, and I'm thinking about getting some small, white oak (with no paraffin lining) "tight" barrels in the 1- to 5-gallon range. The cooper sells them as "plain, toasted or charred." What would work best with my homebrews? I'm assuming that lagering would not work well, so I would probably stick with pale ales and stouts.

Also, I'd like to start aging spirits such as brandy and whiskey in one of these barrels. I've tried a plain barrel before, and have liked the results (at least on cheap brandy).

Would I be able to alternate beer and spirits? Or should I keep them in separate barrels? Also, is there any special preparation I should go through prior to storing beer and spirits in these barrels? I think I'm already aware of most of the sanitation concerns regarding beer.

Thanks,  
Brian Bartz  
Bartzbrau AG  
Houston, Texas

Hey, Hey Brian,

*Seems like oak is on our minds these days. In the last issue of Zymurgy (September/October 2002) I had another letter on this subject.*

*Of course, you are on the frontier of beer here. If I were you, I'd go for the toasted version. I can only imagine that the char would act like a carbon filter, filtering (absorbing) out flavors. Maybe I'm wrong here. Keep in mind that with a new barrel the wood imparted flavors will be mighty intense. Or perhaps have the beer reside in the barrel only a day or two with the first few batches. I did this once with a mead—put it into a new barrel for a week and then siphoned it out into a carboy. Wow. It tast-*

*ed pretty intense at first—kind of like rough bourbon. I let it age for another year in the glass carboy and it eventually mellowed out.*

*I have been told that if I had left it in the barrel for a longer period of time the aging process would have been accelerated because of the continued reactions with the wood and the fact of porosity. The air exchange with the beer, while it may have oxidized the beer to a fault, would have helped mellow out the wood characters. So I'm imagining you're better off with strong brews, where the alcohol intensity and chemical changes it will undergo may enhance the beer. If it's going to be a pale ale, make it an imperial pale ale; if a stout, make it an imperial stout.*

*Alternating between spirits and beer could produce some great results but don't count on duplicating them with any consistency.*

*Finally, I'd get a few 1-gallon kegs and*

*do some experiments before committing a whole 5 gallons to the time and expense. But if you've got the time and money—well, send me a few results!*

*Let's have a woodsy,  
The Professor, Hb.D.*

### Baby Brew

Dear Professor,

I need your experienced help. I'm brewing my first lager to celebrate the birth of my baby. I noticed I made a mistake in my notes and wrote 1 tablespoon of gypsum instead of 1 teaspoon. Since I didn't intend to brew a bitter laxative to celebrate with, I need to decide (quickly) if I should start a new batch.

Under normal circumstances I'd wait and see. But this batch is especially important to me, and I have only one shot at this (due to the long time to lager). However, my wife doesn't want to waste the time/money on another batch if this batch stands a chance.

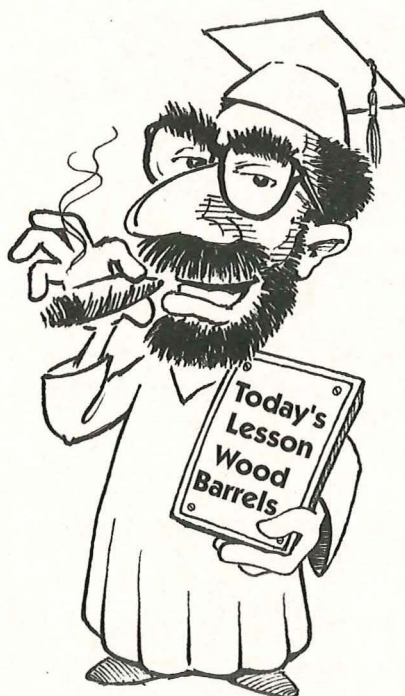
Based on the information below, do you think the excess gypsum may ruin the batch?

Also, if I do start over, what would you change in the recipe, if anything? I'm a rookie.

Best Regards,  
Mike and Shelly

Dear Mike and Shelly,

*A bitter laxative? Gypsum isn't going to make your beer bitter nor will it become a laxative, even at six times the amount you've put in. Frankly, I don't think calcium sulfate is a laxative. Anyway, 1 tablespoon versus 1 teaspoon isn't going to throw off the flavor of your beer negatively. You may get a different type of bitterness from your hops, but*





that difference would be more like an English ale rather than a "bad" difference.

Now if you had put in 1 tablespoon of Epsom salt (magnesium sulfate) or table salt (sodium chloride) you would have some taste problems. But you should be getting psyched to celebrate—because your beer is gonna be just fine.

Relax. Don't worry. Have a baby.  
The Professor, Hb.D.

### Off the Gas Charts

Dear Professor,

I recently went on a brewing rampage and whipped up four batches of beer in one week—a Bavarian wheat, an American wheat, an English ordinary ale and a German alt. At the time of kegging (I kegged all the beers on the same day), each beer turned out well with each matching its own flavor profile.

I want to eventually bottle some of my beers (I use a basic counter-pressure bottle filler). Last time I bottled my beers they turned out relatively flat, so I figured I'd

crank up the pressure and let beers "super-carbonate" for bottling. Well, I turned it up to 30 psi (at 40° F). Anyway, I let my beers sit for approximately three weeks at 30 psi before I attempted to bottle. During that three weeks I noticed that my beers were mellowing at an accelerated pace, so much so that at the time of bottling, all four beers mellowed to the point of almost tastelessness; turning out with only a crisp flavor (practically void of any maltiness or hops) with a peculiar sweet finish. I was astonished as to how all four beers practically tasted the same.

Is this a normal occurrence with force carbonation—extremely accelerated in my case, at 30 psi? (Sheesh!) If so, how long can a beer keep in a keg before it mellows too far?

Sincerely mellowed,  
Chris Belsky  
Milwaukee, Wis.

Chris,  
I like the "Sheesh" you slipped in after the last "psi." That was really a nice touch.

Meanwhile you speak of force carbonation at high volumes of carbon dioxide, as well as some pretty cold temperatures. Lucky for you, you didn't proceed at 32° F (0° C). At 30 psi and 40° F (4° C) you got some high volumes of carbon dioxide in your beer. What you are "tasting" is an explosion of carbon dioxide bubbles on your tongue. That sensation alone is enough to cancel out the existing malt and hop flavors. Essentially you over-carbonated your beer to the point of tasting a lot of "carbonic acid" in the form of dissolved carbon dioxide.

To get the correct amount of carbonation typical of most beer styles you'll want about 2.3 to 2.5 volumes of dissolved carbon dioxide in your beer. You'll want 3.0 volumes for Bavarian wheat beer for typical carbonation. If your beer is at 40° F (4° C) that means you apply about 11 or 12 psi (30 psi is off the chart!) for your ordinary ale, American wheat and German alt, and 18 psi to your Bavarian wheat, and let the gas saturate into the beer over time. To accelerate the process, shake the beer.

So for your overcarbonated batch, what you have to do is set your pressure gauge at the desired pressure and let it slowly vent off or just keep releasing the gas until the beer pressure begins to stabilize at 11 or 12 psi. Then you've got your beer back.

Venting,  
The Professor, Hb.D.

### Never Go Straight, Always Go Ahead!

Dear Professor,

I'm a 24-year-old homebrewer who loves to experiment but isn't very good at it. My best brews have (and I'm embarrassed to say this) come from extracts. I grow my own hops for my brews (Cascade) and my own grapes for my wine. But, after my most recent experimental disaster, I have begun a quest for what I believe to be a necessity in the homebrewer circles: a taste table—something to describe what characteristics (taste, flavor, body, aroma) certain items impart to beer.

For instance, with coffee: I took 5 pounds amber extract, 2 pounds crystal 40 L and 2 pounds chocolate malt (350 L) for a brew. I then added one pot of coffee to the



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end of the wort and one pot just to the secondary fermenter. I let it bulk-age at 65° F (18° C) for four weeks. What a disgusting mess this created.

Another addition to beer I've recently read about is rose petals! What would this do to beer? What about the characteristics of the different hops? What's the difference between Saaz and Hallertauer? I know where they come from but I have no idea what they actually do to brew.

What about mint leaves, lavender, jasmine, vegetables or BBQ sauce? A bit extreme, I know. But from what I've learned, I think maybe homebrewing, or brewing in general, is ready to take the next step.

This next step may not exist, this type of table may already be out there or maybe no one is ready to go this direction. But with what I've seen people do to wine, I think the same variation could be applied to beer. Can you point me in the right direction or just set me straight?

Thank you,  
Charles Gilman  
Lacey, Wash.

Dear Charles,

*I wouldn't doubt for a minute that you already are straight. But if you want to experiment never, ever go straight—just go ahead.*

*First of all, WOW—2 pounds of chocolate malt and then 2 pounds of coffee for what I assume is a 5-gallon batch is, well, rather aggressive (can you tell I'm being polite?). Actually, forget being polite—it's a ridiculous amount of those ingredients for a 5-gallon batch of beer. You are quite right and so was Stan Laurel: "What a fine mess you've gotten yourself into."*

*I think what you are really getting at is how much of certain ingredients do you need to make desired impacts on 5-gallon batches of beer. Here's my quick attempt to begin to put some perspective on some of the ingredients you list.*

*Coffee: one quarter to a half pound. But don't boil it—it gets nasty.*

*Mint leaves: one cup freshly crushed.*

*Lavender: 0.25 ounces of dried flowers.*

*Vegetables: Perhaps 5 or 6 habañero chile peppers. But a couple of pounds of cooked mashed pumpkin. (Editor's Note: See the arti-*

*cle in this issue on brewing with chile peppers.)*

*BBQ sauce: Now don't get ridiculous on me. Or are you serious? I'm not putting a vinegar-based sauce in my beer!*

*Now about different kinds of hops—you'll just have to either buy beer made with these hops and taste it, or brew, learn and taste yourself. Or better yet, form or join a homebrew club and taste other homebrewers' beers with the ingredients you've been wondering about and experience it for yourself.*

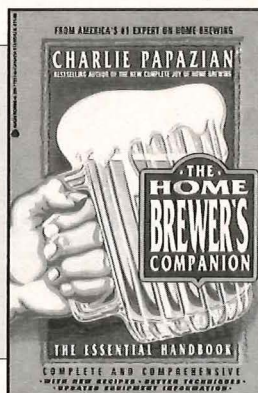
*Read, read, read the pages of Zymurgy: winning herb, spice, fruit, vegetable and experimental recipes in every issue. You'll begin to get a feel for amounts.*

*Meanwhile say "amen" to that first coffee beer. And by the way DO NOT be ashamed to use malt extracts. I still do and make A-1 quality beer; and you probably do too.*

Amen,  
The Professor, Hb.D. (continued on page 54)

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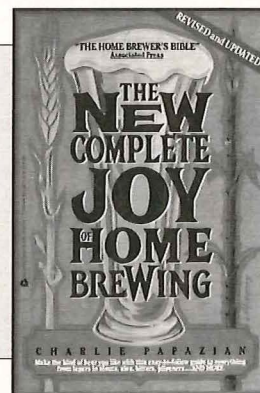
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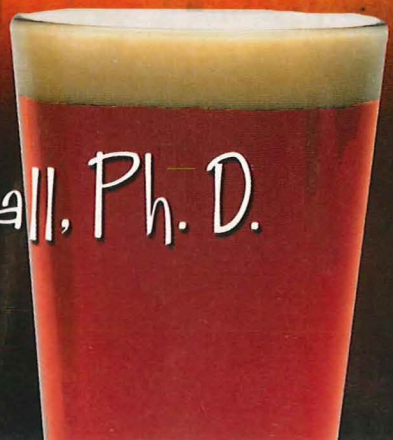


The  
Green,

The Red,

And The  
Spicy

by Michael J. Hall, Ph. D.





# Hot peppers find their way into beer and more in New Mexico



**C**hile! In beer? Nothing strikes more fear into the hearts of beer judges than the words *chile beer*. "That one will definitely have to be judged last in the flight—wouldn't want to ruin our palates, would we?"

What would possess a brewer to deliberately put hot chile peppers into a perfectly good beer, and why would anyone drink it? Let's peel this chile and see.


## Why Brew with Chiles?

In New Mexico, where the official state question is "red or green?" it's just natural to want to put chile in beer. Red or green refers to your choice of chile to be slathered on top of your meal. Appropriate answers also include "Christmas," in

which case you receive both. New Mexican cuisine constitutes an homage to the chile plant, with dishes such as *carne adovada* (hunks of pork stewed in red chile sauce), *chile rellenos* (whole green chiles stuffed with cheese, battered and deep fried) and *huevos rancheros* (a fried egg or two served on a blue corn tortilla, smothered in red or green chile), to say nothing of the more pedestrian *enchiladas*, *tamales*, *burritos* and *tacos*.

"Chile," by the way, is the preferred spelling in New Mexico. "Chili" is that eastern/Texan concoction of tomatoes, beans and meat, and "chilli" is the spice powder mixture that contains ground chile and other things like cumin. Sure, chili is good in its own right, but that's not what we're talking about.





# Scoville Ratings By Chile Type

Pepper Type	Scoville Units		Color
	Min	Max	
Pure capsaicin		16,000,000	
Habañero	95,000	577,000	Orange
Scotch Bonnet	100,000	350,000	Red/Yellow
Jamaican Hot	100,000	200,000	Red
Thai	50,000	350,000	Red
Chiltepín	50,000	100,000	Red-orange
Pequín	30,000	85,000	Red
Cayenne	30,000	125,000	Red
Tabasco	15,000	50,000	Red
Serrano	5,000	50,000	Red
Chile de Árbol	15,000	30,000	Red
Chipotle	5,000	10,000	Black
Jalapeño	2,500	8,000	Green
Guajillo	1,500	5,000	Green
Mirasol	1,500	5,000	Red
Pulla	700	5,000	Red-purple
New Mexican	100	5,000	Red/Green
NM: Española Improved	2,500	5,000	Red/Green
Cochiti	2,500	5,000	Red/Green
Cherry	100	3,500	Red
Rocotillo	1,500	2,500	Red
NM: Sandía	500	2,500	Red/Green
NM: Chimayó	1,500	2,500	Red/Green
Pasilla	1,000	2,500	Black
Cascabel	1,000	2,500	Black
Numex Big Jim	500	2,500	Red/Green
Anaheim	500	2,500	Red/Green
NM: Jemez	1,500	2,000	Red/Green
NM: Española	1,000	2,000	Red/Green
Ancho	1,000	2,000	Purple-black
Poblano	1,000	2,000	Green
Pepperoncini	200	1,000	Red/Green
Bell Pepper	0	600	Red/Green/Yellow/Orange
Paprika, Pimento	0	500	Red
Sweet Italian	0	100	Red/Green

More acres of chile are grown in New Mexico than in all the other states combined, and more chiles are consumed in New Mexico per capita than in any other state. You might think it's the pain-killing endorphins produced by the brain that nullify a burning tongue and keep people coming back for more, and you wouldn't

be completely wrong. But New Mexicans are quick to tell you that it is also the flavor of the chile that they crave. I guess there is no simple explanation for the desire to infuse beer with chile except for the uncontrollable urge to put chile into everything. All that is left is to determine how to do it well.

## Drinking Chile Beer

When is the best time to drink a chile beer? A tall, cold, spicy one goes naturally with New Mexican food, blending with and accenting the southwestern flavors. You might think chile beer is merely a novelty for the tourists, but the locals buy it by the pitcher to drink with chips—no salsa necessary.

Chile beers vary greatly in flavor and heat. Some are so mild that only the chile flavor comes through, such as Rio Grande Brewing's golden Pancho Verde Chile Cerveza, which has won Great American Beer Festival® medals. Others are so hot that a sip will make your buds think that the barn is on fire and there's not a bucket of water in sight. Personally, I prefer a beer with lots of chile flavor and a smooth burn that builds and lets you know the chile is there without making you want to cut out your own tongue. There is even some variation in the way the burn comes through: some chile beers have an afterburn in the back of your throat after you swallow, others have a sneaky, slow-growing burn that is only evident after a half pint or so.

The color characteristics of chile beers are strangely consistent, as if New Mexican brewers had subconsciously followed the prescriptions of Belgian monks. Green chile beers are usually pale, with either a wheat beer or pale ale as a base, but red chile beers are usually a variation on the brown ale theme.

Chile beers uniformly have poor head retention because of the chile's oils. Often pale chile beers will show a haze, but this depends on how the peppers were added and whether or not the beer was filtered. A good chile beer will have a prominent chile aroma, but common flaws include a vegetable smell and/or a sour taste, depending on the way the chiles were processed. You can choose to enhance the pleasant aromas of smokiness (from the roasting process), earthiness and roasted grain in chile beers as well.

## Chile Characteristics

The genus *Capsicum* is comprised of various peppers, from the innocuous green bell pepper and pimento to the searing Scotch bonnet and habañero. Columbus was the one who started the confusion



# Eske's Taos Green Chile Beer

Brewed by Steve Eskeback at Eske's Brewpub in Taos, N.M., and winner of the bronze medal in the Fruit and Vegetable Beer category at the 1993 Great American Beer Festival®.

For 5 U.S. gal (19 L)

- 7.0 lb (3.2 kg) pale ale malt
- 1.0 lb (0.45 kg) malted wheat
- 0.5 oz (14 g) Chinook hops, 13.2% AA (90 min)
- 0.5 oz (14 g) Chinook hops, 13.2% AA (60 min)
- 1.0 oz (28 g) Cascade hops (finish)
- 1.0 lb (0.45 kg) fresh roasted New Mexico green chiles

Wyeast No. 1187 Ringwood ale yeast

- OG: 1.039–1.041
- FG: 1.008–1.010

## Brewer's Specifics

Conduct a short (five to 10 minute) protein rest at 122° F (50° C) then saccharification rest at 150° F (66° C) for 10 to 15 minutes followed by a rest at 158° F (70° C) until conversion is complete. Eskeback uses Sandia chiles from Taos Chile Brothers Roasting Co. Put fresh roasted green chiles (unpeeled) in a grain bag and add to the beer after fermentation (think dry-hopping with chile). Leave beer in contact with the chiles for a week, then squeeze the bag and remove.

with pepper when he mistakenly thought that he had discovered the black pepper plant (true pepper is *Piper nigrum*, and is not related to the chile).

The defining characteristic of hot chiles is the chemical 8-methyl-N-vanillyl-6-nonenamide, also known as capsaicin. The heat intensity of a particular chile can be measured by the amount of capsaicin present. One popular method is the Scoville Rating System, where one part per million of capsaicin equals 16 Scoville units. New Mexico chiles, both green and red, range from 100 to 5,000 Scoville units, jalapeños vary from 2,500 to 8,000 Scoville units and habañeros burn up the charts with up to 577,000 Scoville units. Thus, New Mexican chiles are by no means the hottest, but many consider them to be among the most flavorful. See sidebar for a comparison of chile pepper heat ratings.

New Mexican chile beers are most commonly made with—surprise—New Mexican green and red chiles. The chiles come from the same plant, but are picked at different stages of maturity. Green chiles, the

Green chiles, the younger fruits, are flame-roasted until the skin is blistered and blackened. The aroma of freshly roasted chiles from street-side vendors is a familiar autumn experience that draws customers like moths to a flame.

younger fruits, are flame roasted until the skin is blistered and blackened. The aroma of freshly roasted chiles from street-side vendors is a familiar autumn experience that draws customers like moths to a flame. The vendors, many of whom are local chile farmers, roast them in large metal mesh drums that rotate to keep the peppers from scorching over the propane flame.

After roasting, the chiles are put into plastic bags to “sweat,” which helps to

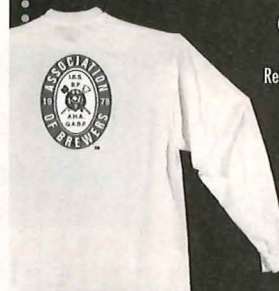
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loosen the skin. Once cooled, you can peel and freeze chiles, or leave the skin on for removal later. Green chiles freeze well, and frozen chiles are preferred to canned ones, which often have acidic overtones. Green chiles come in varieties carefully bred and crossbred through the years. Varieties include New Mexico No. 6, Española, Chimayó, Sandia and the popular Numex Big Jim.

Red chiles are the mature fruits of the same plant, and are typically used in a dried form. The whole chiles often are

strung closely together to form a *ristra*, which serves as both chile storage and decoration. You can pluck dried whole red chiles right off the *ristra* and reconstitute as needed. The dried chiles also can be ground to make red chile powder.

### The Green

Steve Eskeback, who has been brewing green chile beers since before 1989 when he won the best of show prize at the New Mexico State Fair with one, believes that a lighter beer is necessary to show off the flavors of



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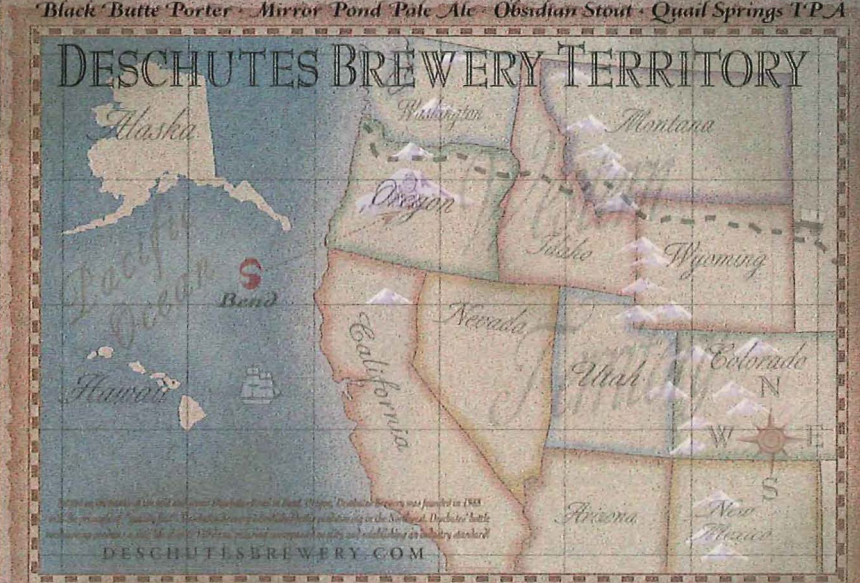
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## DESCHUTES BREWERY TERRITORY



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## Rio Grande Green Chile Mead

**Brewed by Brandon Santos at Embudo  
Station Brewpub, Embudo Station, N.M.**

**For 5 U.S. gal (19 L)**

**7.75 lb (3.5 kg) Great Western  
two-row malt**

**1.25 oz (35 g) Mt. Hood hops,  
3.8% AA (60 min)**

**1.50 oz (43 g) Mt. Hood hops,  
3.8% AA (30 min)**

**5-10 whole fresh roasted New  
Mexican green chiles  
(extra hot)**

**Wyeast No. 1007  
German ale yeast**

- OG: 1.040
- FG: 1.008

### Brewer's Specifics

Strike at 155° F (68°C), add heat as necessary to maintain this temperature. Mash out at 168° F (76°C) after starch conversion is complete.

Put roasted, whole, unpeeled green chiles into the brew kettle while sparging (as you would with first-wort hops), boil the chiles with the wort, strain out with the hops at the end of the boil. No finishing hops.





the green chile. He originally started out with Charlie Papazian's recipe for "High Velocity Weizen," but like any brewer, he eventually made some modifications.

Of course, the biggest change he made was adding green chiles. After some experimentation, he found he could achieve consistent flavor by "dry-hopping" with green chiles—that is, adding the peppers after the beer is finished fermenting. Eskeback puts the chiles in a grain bag for easy removal; contact time is limited to about a week. Scott Moore and Andrew Leith at Rio Grande Brewing Co. in Albuquerque use a similar method to insinuate green chile into their beer, and then they filter to get a crystal clear finished product.

You have several choices when it comes to chiles for brewing. Hands down, the best kind of green chile to use is fresh roasted. Don't bother peeling the pods—the roasted skins contribute a smoky flavor to the brew. Second best is roasted chile that you've purchased from a street vendor and frozen. In fact, frozen fresh-roasted chiles may even be preferred because freezing breaks the cell walls in the chile, which releases more pepper essence. If you can't get roasted green chile from a neighborhood vendor, a convenient substitute is commercially frozen chopped green chiles—in New Mexico everyone uses Bueno ([www.buenofoods.com](http://www.buenofoods.com)). As a last resort use canned green chiles. Although they are more readily available, they sometimes have a disagreeable acidic flavor.

When working with chiles, it is a good idea to wear gloves to protect your hands from the capsaicin, and be sure not to touch your eyes or other sensitive areas. The oil will burn.

## The Red

Dark beers with some residual sweetness seem to stand up better to red chile flavors. Brandon Santos at the Embudo Station Brewpub uses a brown ale for his base beer, and Guy Ruth of Dry Gulch Brewpub in Albuquerque has experimented with Scotch ales and bocks—even doppelbocks—as the base beer.

Red chile beers make use of the dried form of the chile. You can get whole chile



# Ristra Red Chile Beer

Brewed by Brandon Santos at Embudo Station Brewpub, Embudo Station, N.M.

**For 5 U.S. gal (19 L)**

- 7.25 lb (3.3 kg) Great Western two-row malt
- 0.5 lb (227 g) Great Western Carastan malt
- 0.5 lb (227 g) crystal malt (17 L)
- 1.5 oz (43 g) chocolate malt
- 0.75 oz (21 g) Cascade hops, 4.9% AA (60 min)
- 1.25 oz (35 g) Cascade hops, 4.9% AA (30 min)
- 5 whole dried red chiles from a ristra, crushed by hand
- 1 whole dried red pequin chile, crushed by hand (optional for extra heat)
- Danstar Nottingham ale yeast

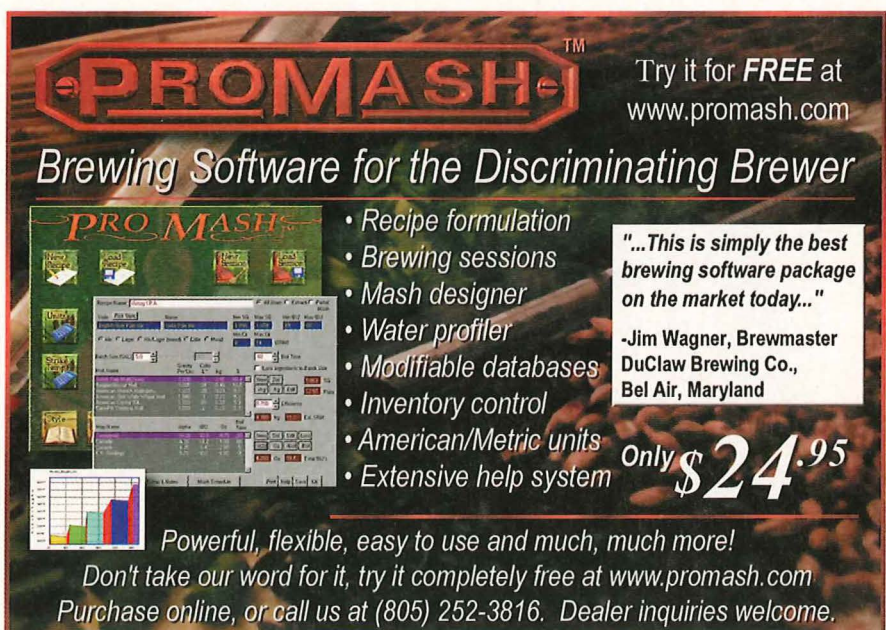
- OG: 1.044
- FG: 1.016

**Brewer's Specifics**  
Strike at 155° F (68° C), add heat as necessary to maintain temperature. Mash out at 168° F (76° C) after starch conversion is complete. Put crushed, dried red chiles into the brew kettle while sparging (as you would with first-wort hops), boil the chiles with the wort, strain out with the hops at the end of the boil. No finishing hops. The yeast has only a medium attenuation, which leaves the beer with the desired sweetness.

Pods separately, or pull one off a chile ristra. The dried chile is usually reconstituted in some manner for cooking, but that is not necessary when adding it directly to beer. Cut the chile into small pieces or crush it by hand, then put it directly into the beer. Ruth uses the "dry-hopping" method and leaves the chiles in the beer for about two weeks. Santos puts the chiles

into the boiling kettle and sparges the hot wort on top of them—first-wort chiles! The chiles get boiled with the hops and strained out at the end of the boil, which allows for a more complete removal that may improve chill (chile?) haze.

It is also important to use good quality chiles to start with—I recommend using whole dried New Mexican red chiles. If



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you can't get them locally, there are a few places to mail order a ristra, including [www.ChileTraditions.com](http://www.ChileTraditions.com). You might even be able to make a beer with red chile powder, but that could cause sparging problems depending on your set-up.

## The Spicy

Many other chiles can be used in beer, including the small but potent pequín, the fiery jalapeño and the serrano, a slightly milder and meatier substitute for the Thai dragon. Many chiles are higher on the Scov-

ille scale than New Mexican chiles, so dramatically scale back the amounts used in recipes unless you are trying to create a universal solvent.

Ancho and pasilla chiles have flavors reminiscent of raisins; habañeros have a very fruity, apricot-like flavor; and chipotles (ripe red smoked jalapeños) offer a smoky overtone.

In addition to the dry- and first-wort "hopping" techniques, you can slice and insert smaller chiles into individual bottles at bottling time. Doing this allows experi-

mentation with just a few bottles, but can lead to long contact times and very hot beer. If you are faced with a too-fiery beer, dilute with more beer.

## Chile Mead

Being a meadmaker living in New Mexico, I decided that I needed to make a green chile mead. I pasteurized the green chiles along with the honey-water must and left them in the fermenter until the first racking. There was no need to add yeast nutrients because the chiles provided them. I then followed my usual technique for a sweet still mead: add part of the



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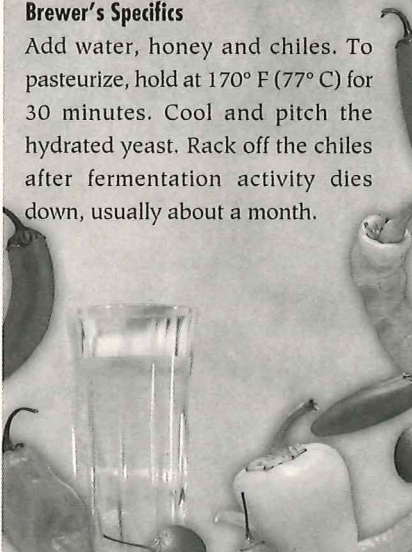
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## Mike's Green Chile Mead

**For 5 U.S. gal (19 L)**

- 15 lb (6.8 kg) Clover honey
- 1 lb (0.45 kg) fresh roasted New Mexican green chiles, unpeeled
- 2 packages Lalvin K1V-1116 (Montpelier) yeast
- OG: 1.115

**Brewer's Specifics**  
 Add water, honey and chiles. To pasteurize, hold at 170° F (77° C) for 30 minutes. Cool and pitch the hydrated yeast. Rack off the chiles after fermentation activity dies down, usually about a month.





honey, ferment until dry, add sodium benzoate to kill the yeast, add remaining honey, rack between the steps.

The resultant mead was sweet, with lots of green chile flavor and a slight, building burn in the back of the throat. I considered it to be a metheglin rather than a melomel because the chiles added little or no fermentables and effectively played the role of a spice. The sweetness provided a good balance for the heat, but not enough for some of my friends.

## Afterburn

Brewing with chile peppers adds an interesting dimension to your beers and meads. Use fresh ingredients whenever possible, make a good underlying beer and go easy on the heat to ensure a concoction that will have everyone coming back for more.

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Michael L. Hall, Ph.D., is a computational physicist at Los Alamos National Laboratory in New Mexico. A member of the American Homebrewers Association board of advisers, he also brews a mean pot of green chile stew, which, of course, would go nicely with a tall, cold chile beer.



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I'm defining the term "specialty malt" pretty loosely, as it's hard to talk about in the narrow sense. In fact, one of the things I'm trying to get across is that just taking a pale or pils malt base and dolling it up with the specialty grain of choice is not necessarily the best way to end up with a great beer. So I'm including pretty much everything *besides* pale and pils malt in my definition.

**I** Understand Maillard chemistry, at least a little bit. To get really technical, Maillard browning (also known as non-enzymatic browning) is a mind-bendingly complex series of chemical reactions facilitated by water and heat, between various sugars and nitrogenous materials (protein parts) present in grains and many other food products. Through a series of incompletely understood reactions, two main groups of end products arise: small ring-shaped aromatic chemicals; and large polymeric chains having reddish to yellowish brown colors, and which are not particularly aromatic. These reactions produce virtually all of the flavor we enjoy so much in malt: bready, malty, nutty, toasty, roasty and many other flavors all derive from this process.

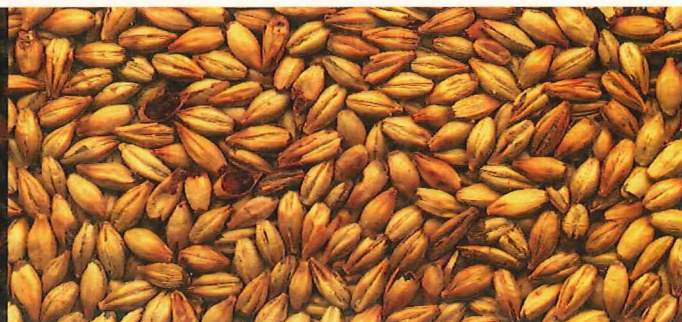
The important bit to know is that every different combination of sugar, nitrogenous material, moisture, pH, temperature and time will produce an entirely different set of end products. A striking example of this is a comparison between amber malt, sometimes called "biscuit," and the high-kilned dark Munich known as "aromatic" malt. Both are about 40° SRM, but the aromatic is kilned moist, the biscuit dry. The former has a less sharp, much more caramel/toffee quality while the latter is crisply toasty. Aromatic malt is my choice for the signature nutty/toasty character that defines a well-made brown ale.

The implication for brewing is that you can get to a particular beer color lots of different ways, with startlingly different flavor profiles. Secondly, using several different malts in a recipe can usually add up to complexity unobtainable from a simpler recipe. Someone, after seeing a talk of mine, went home and brewed a beer with every different malt type he could lay his hands on. He later reported that it was "the best beer I ever made in my life." You don't

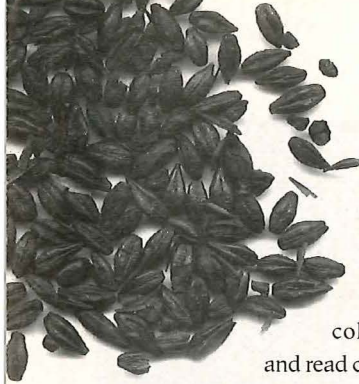
have to go this far, but it does illustrate a point. Most brewers become aware of these principles eventually, but it's nice to know there's a solid scientific foundation for our artistry.

**H**old a malt tasting. This is an easy event to organize for a club or small group. Get as wide a variety of ingredients as possible, although you may want to limit the session—like just doing crystal malts, for example. With crystal especially, the difference between versions of the same color can be quite striking. You can do this as a walk-around. Just place bowls at stations around the room, each one next to a sheet of

By  
**Randy  
Mosher**





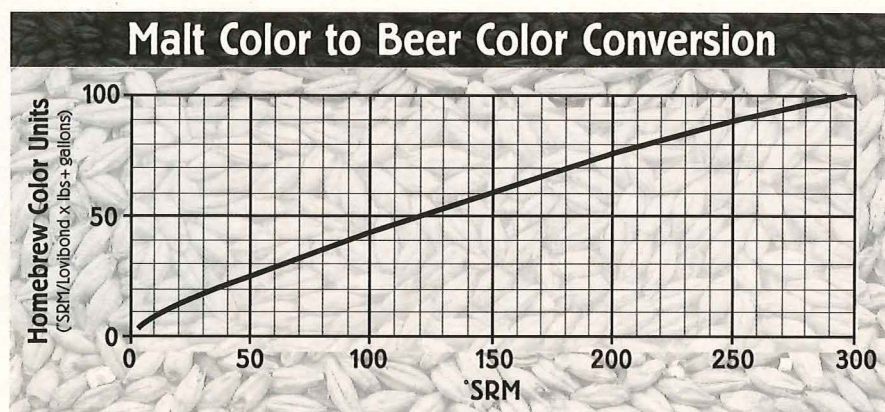


paper participants can use to write down their impressions. At the end, you can collect the sheets and read comments aloud, or edit them into a document to distribute for future reference. If you're really ambitious, you can brew a battery of mini batches and hold an evaluation session with beer as well as malt.

**III Calculate color.** Brewing scientists will tell you this is entirely unscientific, which it is. But you can calculate color in a way that will give you a general expectation of what color your beer will be, and this will allow you to formulate recipes in a much more sophisticated manner. For each malt in your recipe, multiply pounds times degrees SRM or degrees Lovibond, then add them all up and divide by gallons and you get: Homebrew Color Units. The problem is that it's not linear. As you add more and more color, you get a diminishing return, so twice as much colored malt won't make a beer twice as dark, at least by the numbers. It's very complicated, but if you do some measurements, you get a chart like the one above that shows the relationship of calculated-to-actual color. At the low end of the scale it's fairly linear, but by the time you reach a calculated 300, your actual color is only about 100. Like I said, this is art rather than science, but it has produced useful results for me. I usually start calculating color in a recipe with the mid-color malts, then throw in whatever color comes from the palest malt in the batch to see how much darker malt I need to reach the target color.

**IV Try a specialty malt as a base.** Brewers everywhere get into the same old pils/pale rut. There's nothing wrong with either one, but many styles of beer benefit by building up flavor and color starting with a slightly darker malt. Brown ales, for example, are lovely as well as authentic with a base of mild ale malt, a bit

paper participants can use to write down their impressions. At the end, you can collect the sheets and read comments aloud, or edit them into a document to distribute for future reference. If you're really ambitious, you can brew a battery of mini batches and hold an evaluation session with beer as well as malt.



**This chart gives an approximate conversion from homebrew color units to finished beer color based on trial and error. Individual results may vary due to differences in system design and other factors.**

darker and traditionally a little less expensive than pale. Porters and stouts have used it, too. Oktoberfests are often made solely from Vienna malt, which is kilned a little darker than pils malt. Munich dunkels are mostly Munich malt. Not only does this make for tasty beers, it's often traditional practice as well. In medium colored beers, getting color from slightly colored malts can give a depth of flavor that can't be matched by smaller amounts of darker malts.

**V Get more color from medium-colored malts; adjust with darker ones.** If you want full, meaty flavor in your darker beers, you'll be better off using less strongly colored malts to develop most of the color. As an example, amber or biscuit malt is just the thing to impart a nutty, toasty flavor in a British brown ale. The darker crystal malts with their raisiny, dried fruit qualities add a lush opulence to Belgian-style dubbels or strong dark ales.

I am extremely fond of the dark Munich aromatic malt and use it as the signature color in my own Belgian-style pale ale. It has a sort of dry caramel quality, less cloying and fruity than crystal.

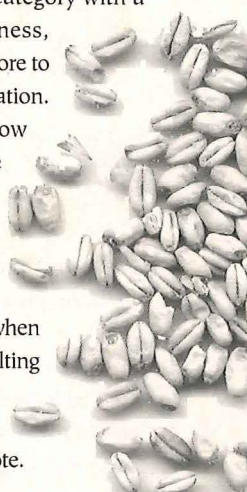
I feel that stouts and porters often benefit from this treatment. A subtle layer of complex, malty richness between the light and dark malts can make these styles much more intriguing. Amber and brown malts not only offer toasty, roasted variations on the familiar black malt and roast barley in

stouts and porters, but they're traditional practice—especially before 1850. If you're trying to win the dry stout category with a dead-on version of Guinness, don't do it, but there's a lot more to stout than that one interpretation.

If your calculations show that you need a little more color to hit a particular style or artistic goal, a bit of black malt will do the job without changing the flavor much. The Scots sometimes do this when making Scotch ale. The resulting beer looks different but tastes nearly the same—or may take on a subtle new flavor note.

**VI Don't mash crystal.** While the mashing chemistry of making crystal malt does lock the sugars into configurations that are more resistant to enzymatic attack during mashing, if you're using crystal malt as a body-builder, you'll get the most out of it by adding it to the sparge rather than at the start of the mash.

**VII Try a few beers without crystal.** Remember, for the first 9,900 years of brewing, crystal malts were unknown. All historical styles created prior to 1885 or so were made without it. It does have its place—nothing can jazz up an extract beer like a pound of crystal—but I believe homebrewers overuse it and that more authentic, sometimes even better-tasting beers can be





made without it. You may not agree, but it's something to ponder and try for yourself.

## VIII Don't bother infusion-mashing unmalted wheat.

Recipes for witbier and lambic call for the use of unmalted wheat. I've both studied the literature and brewed a number of different versions, and I can say with certainty that if you want that authentic, creamy, almost milkshake texture that's part of the magic of witbier, an infusion mash simply isn't up to the task. The best procedure I have found is an American-style adjunct mash, which is quite similar to the traditional witbier procedure. The finely ground wheat is mixed with 10 percent of the malt, raised up through protein rest, then saccharification, and on up to boiling, where it is held 10 minutes or so. This boiled mash is then added back to the rest of the mash, which at this point has been raised to protein rest temperature, and the boiled mash will raise the whole thing up to saccharification range.

Yes, if you're asking, it's a pain in the rear to do, but for me, it's worth it. I did come up with a workaround recently while brewing a witbier with Pete Crowley at my local Rock Bottom. We simply substituted malted for unmalted wheat, and increased the percentage from 50 percent up to 60 percent of the batch. The results were pretty good, but if we do it again, I'm going to recommend we up it to 70 percent for just a little more wheat character, and this is what I suggest if you want to give it a shot. With that amount of wheat, don't forget to add rice hulls to prevent a sluggish runoff.

## IX Toast for extra flavor.

Sometimes you can get that extra little twist for a recipe by lightly toasting some pale or wheat malt. Oatmeal makes a nice addition when you toast it until it starts to smell like cookies—intoxicating and unmistakable. The flavor comes through in the finished beer and it can be just the thing to top off a brown ale or stout. Spread the grain on a cookie sheet. Ten to 20 minutes at 350°

F should do it. Don't go by color; follow your nose. Toasted grain will brew much darker than it looks, so you're not necessarily looking for much of a color change. If you do decide to go darker with the toast—much beyond a very pale gold—try to allow a week or two for the malt to mellow before brewing with it. This isn't like coffee; there are some harsh aromatics produced by roasting that are better left out of your beer. To achieve this, a little rest time is advised.

## X "Cap" your mash for a darker, more flavorful, second-runnings beer.

Strewing colored malt on top of the mostly spent mash bed before sparging a small beer is a practice called "capping."

## O

atmeal makes a nice addition when you toast it until it starts to smell like cookies—intoxicating and unmistakable. The flavor comes through in the finished beer and it can be just the thing to top off a brown ale or stout.

Amber malt was often used for this in *ye olde England*, but crystal malt is more perfectly suited, as it is essentially mashed in the husk, and only needs to be dissolved into the wort. This technique allows you not only to make two beers from one grain bill, but also to vary the style and character of the second, smaller beer to be different from that of the first.



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## Conclusion

Every brewer masters the process of adding specialty grains early on, but true mastery of malt flavors and their subtle influences on the finished beer can last a lifetime. I urge you to explore, experiment and experience the texture of malt using these and other techniques. As you do, you'll develop a deeper understanding and no doubt an even greater love for that fine beverage that we call beer.

A homebrewer since 1984, Randy Mosher frequently writes and lectures about beer and brewing. He is the author of *The Brewer's Companion*, a comprehensive home brewing manual, is a frequent contributor to *Zymurgy*, and serves on the American Homebrewers Association Board of Advisors. He is also active in the Chicago Beer Society, the country's largest and oldest independent beer appreciation society. In his business life, he is a graphic designer and marketing consultant specializing in food and beverages and especially (you guessed it) beer.







# Bell's Expedition Stout

## A Beer Beyond The Dreams of Avarice

By Greg Kitsock

**F**ew beers can be described as “meaty” in both the figurative and literal senses of the word. Expedition Stout, from the Kalamazoo Brewing Co. in Kalamazoo, Mich., is one. In a recent issue of *American Heritage* magazine profiling America’s brewing industry, Michael Jackson describes the oily, black liquid as tasting “like beef braised with prunes and port wine.” It’s an appropriate description for a beer so thick and rich it almost amounts to a meal in a bottle.

Based on the strong, well-hopped ales that England once shipped to the czar’s court, Expedition Stout measures between 10 and 11 percent alcohol by volume (abv). You don’t seek out a beer like this just for the buzz. Malt liquor can give you that, and it’s cheaper and more readily available. Expedition Stout is a connoisseur’s product. Generally, Kalamazoo Brewing will do six to 10 batches between autumn and early spring. Of the brewery’s annual output of almost 30,000 barrels, Expedition Stout will account for fewer than 200 barrels.

“It’s one of our lesser brands as far as volume is concerned, but we like to think that it’s one of the preeminent stouts in the U.S.,” says head brewer Alec Mull.

Owner Larry Bell describes his operation as “the oldest microbrewery east of Boulder, Colo.” He learned homebrewing while working his way through college at a bakery. He began brewing professionally in 1986 after scraping together \$39,000 in working capital. His original equipment consisted of a 15-gallon soup pot and a few plastic garbage cans. “We’re kind of viewed in the industry as being lucky,” Bell once observed. “There’s no way we should ever have survived.”

As this article went to press, however, he was busy installing a 50-barrel Steinecker brewhouse he bought from Anheuser-Busch. The equipment used to belong to Eureka Brewing Co. in Los Angeles, celebrity chef Wolfgang Puck’s short-lived adventure in craft brewing.

Bell’s long-term goal is to become “a serious regional player,” brewing 200,000 barrels a year. But he won’t do this at the expense of having fun. The iconoclastic Bell once made a TV commercial in which a punk accordion player stomps and burns his instrument. “Beer with an attitude” was the tag line.

Bell’s products still have an attitude. Every thousand batches, he brews a one-time-only beer—the latest is what he calls “an imperial smoked ale” which was his 5,000th batch. At his on-site pub, he serves a beer called Eccentric Ale, rumored to contain snuff as one of its ingredients. In July 2001, he celebrated American Beer Month with a classic American style malt liquor, except that Bell fermented his version with 13-percent lager yeast and 87-percent ale yeast. His latest project is a dry-hopped barleywine called Time Capsule Ale.

Did we mention that in November 2001, Bell celebrated the harvest season by brewing not one, not two, not even five, but 10 different stouts? The selection ranged from the year-round Kalamazoo Stout (a classic dry stout brewed with licorice sticks as an adjunct) to Susie’s Sweet Stout (made with lactose and a dehusked roasted barley called carafe) to less traditional varieties flavored with rye, cherries, coffee and an assortment of spices. “When the industry hit a blip, I saw other brewers running for the cover of light beer,” Bell elaborated. “I wanted to reaffirm our commitment to full-bodied beers to our customers.” He intends to reintroduce his cornucopia of stouts in 2002.

Bell first produced Expedition Stout in 1989, packaging it in 187-ml nip bottles. (He’s since switched to standard 12-ounce containers.) As he recalls, the brewery was already doing a fairly strong ale called Third Coast. Bell’s fans would take the beer along on their vacations, photograph themselves with a bottle in exotic locales and send the snapshots to the brewery. “I came up with the idea of doing



a stout designed for these trips, one that wasn't so carbonated it would foam over at the top of Mount Fuji, and one with enough alcohol and hops that it would last on a journey across the Sahara," explains Bell.

Expedition Stout, according to Mull, is brewed with an astounding 1,000 pounds of malt per 10-barrel batch. The grain bill consists of about 78 percent two-row pale, just under 8 percent black malt, an equal amount of roasted barley, 3.6 percent chocolate malt and 1 percent cara-Munich. Additionally, it contains 2 percent flaked barley. "No stout would be a stout without flaked barley," says Mull in praise of this

minor but important ingredient. "It provides great mouthfeel plus a nice grainy flavor, and it gives better head retention."

In addition, he tops off the vessel with malt extract to achieve an original gravity of 1.115 or about 28° Plato.

The hops are 100 percent Centennial, a very generous 2.2 pounds per barrel. There are three charges: the first at 45 minutes into the hour-and-a-half boil, the second at 60 minutes into the boil and the third during the whirlpool. Mull does not dry-hop. He estimates the stout to range somewhere between 80 and 100 IBU. Expedition Stout is noticeably bitter, especially when drunk young, but there are so many intense malty and fruity nuances that the hops don't hijack the beer.

Mull ferments with the house yeast strain, which he describes as similar to an American ale variety. Primary fermentation takes place at 72° F (22° C) and generally lasts for seven to eight days until a final gravity of 1.028-1.032 is reached. He then chills the beer to 55° F (13° C) and allows it to sit a couple days, then further lowers the temperature to 40° F (4° C) and gives the beer another few days to mellow out. The two-step secondary is not a secret process to augment the flavor but is done simply to avoid overtaxing the glycol chiller, confides Mull. He admits that the fermentation process may vary by a few days depending on how the brew is progressing.



**"We're kind of viewed in the industry as being lucky," Bell once observed. "There's no way we should ever have survived."**

"This is a beer we don't rush out the door."

During the bottling phase, Mull prepares a fresh yeast slurry and adds additional yeast and priming sugar. As you'd expect from a strong, bottle-conditioned beer, Expedition Stout ages well. Mull believes it should be laid down for at least three years. "It becomes more like a port or Madeira, and you get those high-gravity barleywine flavors." Bell says he once sampled a 9-and-half-year-old nip bottle that was "absolutely stunning and delightful."

Expedition Stout goes well with a wide variety of foods from a roast or steak to rich, chocolaty desserts. "Break out the Stilton and walnuts!" Bell answers after reflecting for a moment. It also lends itself to beer cocktails. In imitation of the classic mixed drink black velvet (half Guinness, half champagne), Bell recommends a 50-50 blend of champagne and Expedition Stout. "I call it a black-and-blue because that's how you feel in the morning!"

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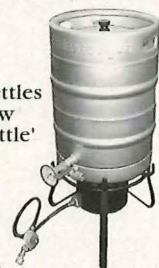
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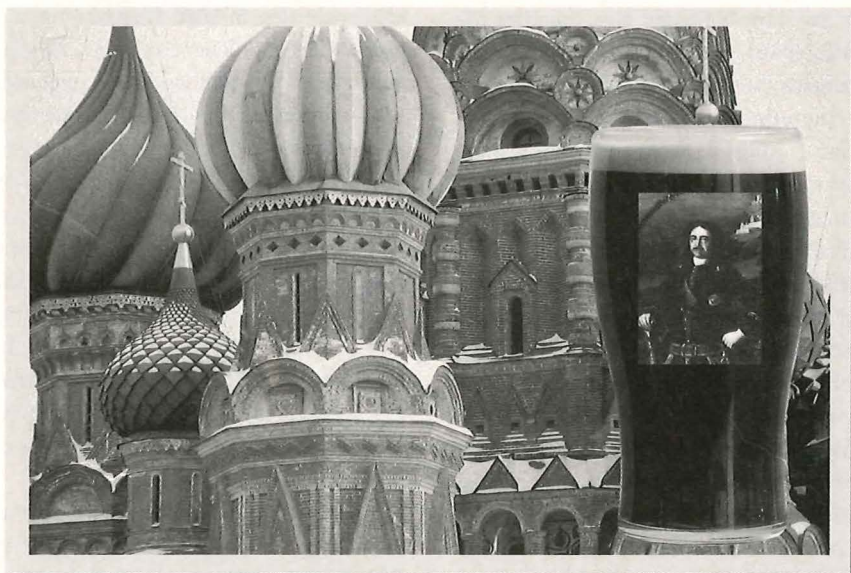


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**At state affairs, Peter (the Great) sometimes had armed guards posted at the doors to prevent the guests from leaving before they had downed all the liquid refreshment.**

Expedition Stout is sold only in Michigan and six surrounding Midwestern states. If you happen to be in Washington D.C. on November 12-13, you'll be able to sample Bell's handiwork at a special tasting at the famed Bricks Keller Restaurant. About 25 years ago, when Bell was a 17-year-old high school student, his older brother (who worked for the NBC affiliate in D.C.) sneaked him into the Bricks Keller, then a one-stop shop for beer can collectors. "We had five beers in cans that night," recalls Bell, including Brew 102 ("the beer perfected after 101 tries") and Hop 'n Gator (a lemon-lime lager that anticipated today's malternatives). Today, Bell's collection of cans and bottles numbers in the thousands. "I think they breed," he says.

It's ironic that Expedition Stout, the ultimate traveling beer, should be available in such a limited area. Imperial stout is one of two beer styles (the other is India pale ale) named not after the land of origin but for an intended destination thousands of miles away. The style seems to have arisen in the late 18th century. Michael Jackson in his *Beer Companion* (Running Press, 2nd edition, 1997) claims that 10 London breweries

were brewing this potent beverage during the heyday of porter for shipment to northern German and Baltic ports such as Bremen, Stettin (Szczecin) and Konigsberg (Kalinigrad). Years later, the makers of Courage Imperial Russian Stout would indicate on the bottle that it was "originally brewed for Catherine II, Empress of all the Russias," indicating a brisk trade in that land as well.

Porter was by far the most popular beer of that time and porter brewers had to concoct a particularly strong, well-hopped version to ensure that the beer would survive the long sea voyage. They were also formulating the beer to the taste of the market. Most of the destinations cited above lay well north of the 50th parallel; the inhabitants of these lands were accustomed to heavy drinking of spirituous liquors as well as strong beers and wines.

Readers unfamiliar with Russian drinking habits of that era, for instance, might want to consult a biography of Peter the Great. Peter, who sought to open his land to Western influences, had an immense capacity for alcohol, and expected his court and the diplomatic corps to follow his example. At state affairs, Peter sometimes

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had armed guards posted at the doors to prevent the guests from leaving before they had downed all the liquid refreshment. During one party on board a ship, he chased the Danish envoy into the rigging to force another cup of vodka on him. When a guest made a *faux pas* at one of Peter's receptions, the unfortunate fellow might have to pay a penalty by downing a quart or more of fortified wine from an immense goblet dubbed the Eagle Cup.

Peter's reign ended in 1725, 35 years before Catherine the Great became czar and probably well before English brewers had established a regular trade with Eastern Europe. Nevertheless, it's possible he played some indirect role in the formulation of the style. One can imagine English diplomats returning home with ruined livers, complaining loudly about the bibulous habits of

the Russians. One can also visualize the porter brewers licking their lips at the thought of a market with a limitless thirst for alcohol.

Exporting beer could be hazardous at times. During the Napoleonic Wars, more than one cargo vessel wound up at the bottom of the sea. Internal politics could also put a damper on business. In 1822, the Russian government, perhaps to encourage home industry, slapped prohibitive import duties on British beer. If the trade was still going on during the early 20th century, the Bolshevik revolution almost certainly put an end to it. Only the nobility would have had the means to drink strong, imported beer on a regular basis; the peasants drank a weakly fermented homebrew known as kvass.

By 1917, however, the British brewing industry itself had changed irrevocably. Porters and stouts had long been supplant-

ed by pale ales. In 1880 the government of Prime Minister William Gladstone had eliminated the tax on malt and sugar, replacing it with a tax based on the original gravity of wort; the excise was payable at the time the liquid was transferred to the fermenter. Consequently, it made little sense for brewers to make strong ales that required long periods of aging; too much cash would have been tied up in the beer for too long. Austerity measures during World War I pushed the average original gravity of British beer down to a tepid 1.030. Both grain in general and the fuel needed to produce highly kilned malts were strictly rationed.

One brand lasted into the late 20th century: the aforementioned Courage Imperial Russian Stout. Its history begins with a London porter brewery operated by a Mr. Henry Thrale, an acquaintance of the great man-of-letters Dr. Samuel Johnson. After Thrale's death, Johnson helped negotiate a sale of the brewery, coining a phrase with his statement: "We are not here to sell a parcel of boilers and vats, but the potentiality of growing rich beyond the dreams of avarice." Appropriately, the solicitation attracted the attention of two bankers, Robert Barclay and John Perkins, who took over the operation in 1781. Terry Foster, in his book *Porter* (Brewers Publications, 1992), actually credits Barclay Perkins with originating the imperial Russian stout style, although this can't be proven beyond a shadow of a doubt. The firm passed to John Courage in 1955, and in 1996 wound up as part of the British conglomerate Scottish & Newcastle, henceforth known as Scottish Courage.

As late as 1993, Courage Imperial Russian Stout was still produced in odd batches at the John Smith brewery in Tadcaster. In a slight variation from history, British beer writer Roger Protz noted that the brewery packaged the draft beer in 4.5-Imperial gallon "pin" casks instead of the 54-Imperial gallon hogsheads that would have been shipped to Empress Catherine's court. Once aged for up to a year in oak casks, Courage Imperial Stout was down to two months of cold-conditioning during its later years—most likely in stainless steel. But it was still a powerful (10 percent abv, about 1.100 OG) and complex brew, with hints of leather, licorice, coffee, raisins and other

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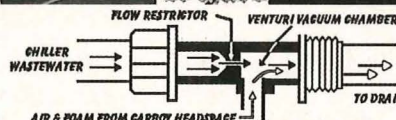
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# Expedition Stout Clone Beer

## Ingredients for 5 U.S. gal.

- 12.5 lb (5.67 kg) two-row
- 1.25 lb (0.57 kg) black malt
- 1.25 lb (0.57 kg) roasted barley
- 0.5 lb (227 g) chocolate malt
- 0.5 lb (227 g) flaked barley
- 4 oz (113 g) cara-Munich
- 4 lb (1.8 kg) amber malt extract
- 3 lb (1.36 kg) dark malt extract
- 5.75 oz (163 g) Centennial hops
- 0.25 oz (7 g) calcium chloride
- Wyeast No. 1056 American ale yeast

- Original specific gravity: 1.110-1.115
- Final specific gravity: 1.028-1.032
- Boiling time: 90 minutes
- Primary fermentation: 7-10 days at 72° F (22° C)
- Secondary fermentation: 2 days at 55° F (13° C), seven days at 40° F (4° C)

## Brewer's Specifics

Mash rest at 150° F (66° C) for 20 minutes, collect wort slowly, sparge at 170° F (77° C). Add malt extract to filled kettle. Add 4 oz (113 g) of hops at 45 minutes into the boil, 1.5 oz (42 g) at 60 minutes, 0.25 oz (7 g) at end of boil. Pitch twice the normal amount of HEALTHY yeast culture, aerate twice normal. Repitch healthy, new yeast culture to prime at bottling. Prime to reach about 2.3 volumes of CO<sub>2</sub>. Age for as long as you can wait, ideally at least three to six months.

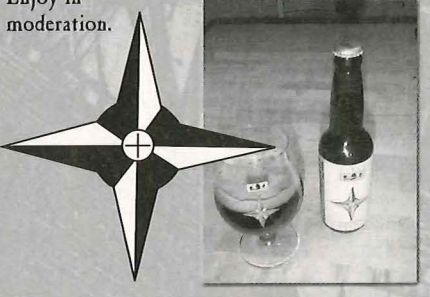
## General Notes

The key to success is a healthy, vigorous yeast, asserts Alec Mull, who provided recipe. "Otherwise, the beer will never go terminal and the residual starch will make it cloyingly sweet." Homebrewer Jim Busch of Silver Spring, Md., who brewed the prototype for Victory Brewing's Storm King, agrees completely. For a 5-gallon batch of imperial stout in the 1.100 OG range, he recommends "pitching the slurry from at least a 1-liter starter, or brew another 5-gallon batch of normal-strength stout or ale and repitch the slurry from that."

## Substitutions

Homebrewers may use up to 5 percent caramel malt in the mash, depending on how sweet they wish the beer to be. Any of the high-alpha acid Pacific Northwest hops may be used alone or in combination. The homebrewer may also substitute English hops for a "more mellow, traditional imperial," adds Busch.

Enjoy in moderation.




fruits. Sadly, Scottish Courage discontinued the brand as unprofitable. The bean counters had succeeded where several world wars and the taxman had failed.

Larry Bell names Courage Imperial Stout as a major inspiration. "When it [the Expedition Stout] ages, I think the two are about the same," he reflects.

Today, the style is enjoying a major revival among American craft brewers who like to try their hand at over-the-top brews. Perhaps the first modern American interpretation was Grant's Imperial Stout from the Yakima Brewing & Malting in Yakima, Wash. Its formulator, the late Bert Grant, managed to push up the original gravity to a respectable 1.070 (about 7 percent abv) through the addition of honey. Other notable examples include Old Rasputin from the North Coast Brewing Co. in Fort Bragg, Calif.; Storm King from Victory Brewing Co. in Downingtown, Pa.; and World

Wide Imperial Stout from the Dogfish Head Craft Brewery in Milton, Del. The latter is the most extreme example of the style, fermented by ale and champagne yeasts working in tandem, and approaching 20 percent abv. It is the world's strongest dark beer and possibly the strongest commercial brew that actually tastes like a beer instead of resembling a brandy or cordial.

A final word on the enjoyment of imperial stouts comes from Alec Mull: sip these beers from a brandy snifter, preferably while sitting beside the hearth on a frigid winter evening. The Russian nobility may have downed them by the flagon whenever the mood arose, but they had coachmen to ferry them about, and they could always sleep-in the next morning.

Greg Kitsock is the editor of *American Brewer* and *Mid-Atlantic Brewing News* as well as a regular contributor to *Zymurgy*. 



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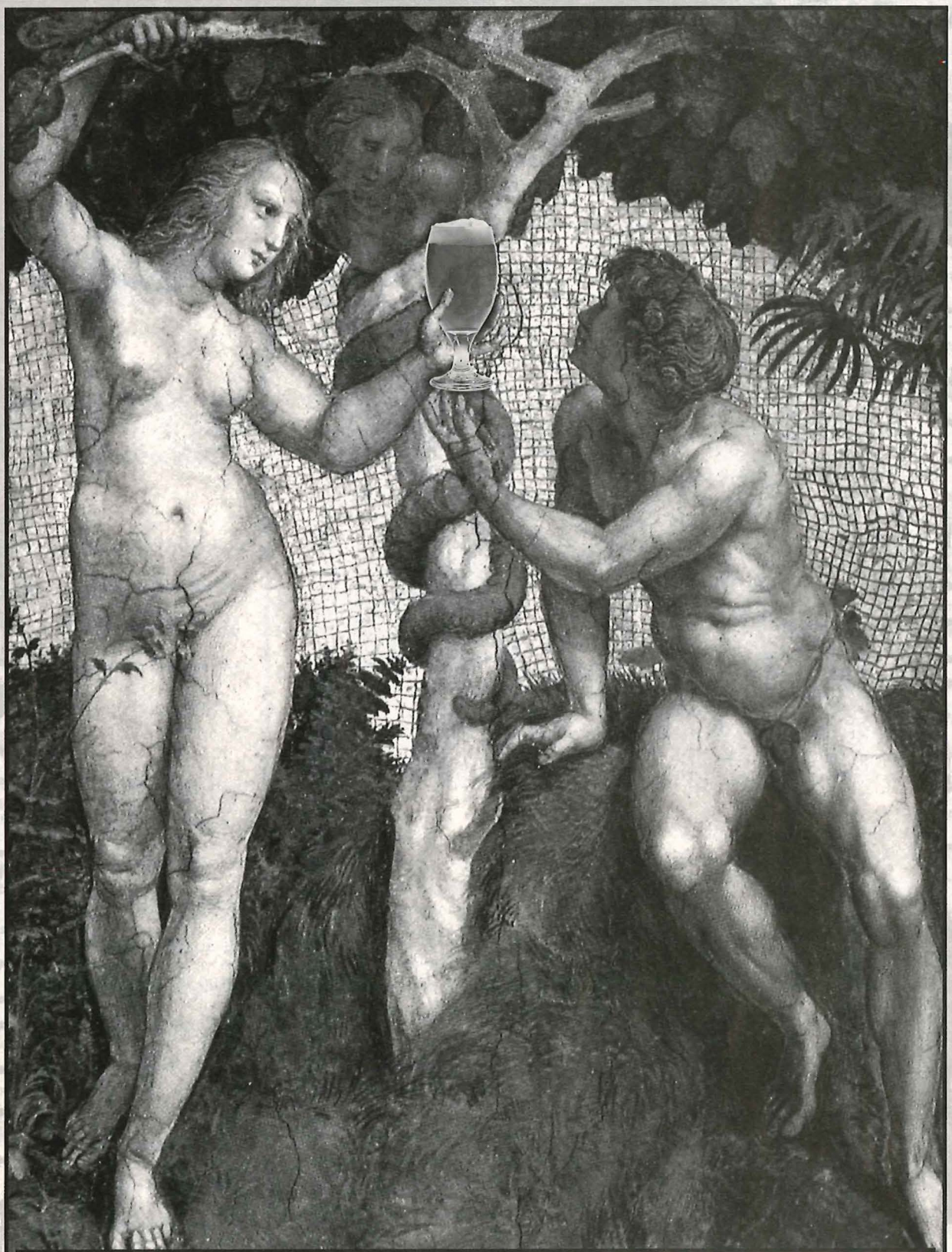
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WHAT'S LEFT IF BARLEY, WHEAT, RYE, OATS AND THEIR ILK ARE FORBIDDEN?





# *The* GLUTEN-FREE BEER CHALLENGE

*Brewing Without Barley, Wheat or Rye*

**I**MAGINE LIFE WITHOUT BEER. No beer brewing, no beer drinking. An unimaginable situation for homebrewers, but a reality for many unfortunate gluten-intolerant souls around the world. The mere thought of having to do without the amber nectar inspired me to investigate gluten-free brewing.

The quest to brew gluten-free beer began in early 1999. A gentleman approached the St. Louis Brews homebrew club with an unusual request. He wanted help brewing a beer that suited his special dietary needs. At that point I knew nothing about "gluten intolerance" or "celiac disease." Still, the prospect of creating something new and unique piqued my interest.

Celiac disease is a genetic disorder that causes damage to the intestinal villi when specific food and grain antigens are consumed. Symptoms may range from latent isolated nutritional deficiencies to the more classic gastrointestinal features such as diarrhea, weight loss, abdominal bloating and malnutrition. As many as one in 150 to one in 250 people in the United States are thought to suffer from celiac disease. The condition is most common among those of European descent. A related disorder is dermatitis herpetiformis, manifesting as a chronic, severely itchy skin condition. The only current treatment for celiac disease is strict adherence to a diet free of grains that contain the problem proteins. Unfortunately, the offending grains happen to be all of the common brewing grains: barley, wheat, rye and oats, as well as other closely related grains such as spelt, emmer, einkorn, kamut and the genetic cross of wheat and rye called triticale.

*By Sean Sweeney*



## MALTED WHAT?

What's left if barley, wheat, rye, oats and their ilk are forbidden? This was the first major hurdle to overcome. Beer sans barley is not unprecedented though. Sorghum is a staple food grain in Africa used in flat breads and porridges and as the base for many sub-Saharan beers. Being cloudy, sour and low in alcohol, these beers are not what Western beer drinkers have come to recognize as beer. Sorghum did seem like a good starting point, however.

The sorghum most commonly grown in the United States is the red variety and is primarily used as cattle feed; therefore, the flavor is not a concern. Early trials of the red sorghum varieties showed it to be unacceptable. It gave the beer an undesirable tannic flavor. Fortunately, some farmers in the United States are switching to the white sorghum variety to meet the dietary needs of those with celiac disease. White sorghum has performed well in many of the trials as a malted base grain and a crystal malt.

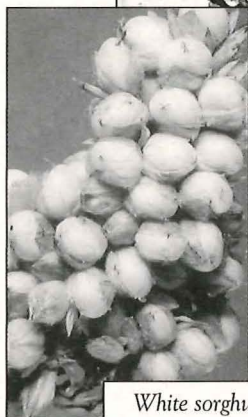
Other grains with some brewing history that are acceptable for the celiac diet include buckwheat, corn, millet and rice. The more unusual and rare amaranth, quinoa and teff are also possibilities. Many of these grains are available raw at local health food stores. A great mail-order source for white sorghum is Twin Valley Mills in Nebraska. Other good sources for low-cost,

food-grade grains are farmers' co-ops.

When buying bulk raw grains, remember to specify untreated feed grain, not seed grain. This is important because grain specifically used as seed is frequently treated or coated with insecticide and fungicide making it unfit for human consumption.

You can often find exotic grains on the Internet from mail-order suppliers. As you might imagine, none of these grains are commercially malted. This necessitates another step in brewing gluten-free beer—home grain malting. I will not go into detail about the malting process here. Instead, I refer readers to the excellent article on home grain malting by George DePiro in the January/February 2001 issue of *Zymurgy*. The techniques used to malt barley can be applied directly to malting gluten-free grains, with minor adjustments in ger-

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mination time to account for smaller kernel sizes. The smallest grains, such as teff, quinoa and amaranth, are perhaps best used in smaller proportions as raw grains. The difficulty in malting these grains outweighs the potential benefits.

Grains are the major stumbling block in brewing a gluten-free beer. Yeast presents the only other significant hurdle, but with some forethought and care, all commonly available yeast strains can be used. Yeast in its pure form is gluten-free. Only when it is propagated in a growth medium that contains gluten does it become a problem. All of the major liquid yeast producers propagate their yeast in a barley-based growth medium, or in proprietary media whose gluten content cannot be easily determined. You can cut open Wyeast smack-packs before smacking them and use the yeast culture in the outer package. The small inner pouch contains the growth medium. However, even the pure yeast from the smack-pack may contain minute amounts of residual gluten from earlier propagation.

To be absolutely sure there is no gluten in the finished beer, it is best to use either dry yeast, which is commonly grown in a gluten-free medium such as molasses, or to plate out liquid yeasts and grow them from

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a single pure colony in a known gluten-free medium. Once a starter of gluten-free yeast is established, standard yeast ranching techniques can be used to harvest, propagate and reuse it as long as clean equipment and gluten-free ingredients are used at every step in the process.

The remaining two beer components present no problem to gluten-free brewing. Hops are naturally gluten-free, therefore no changes need to be made with respect to hopping rates and additions. Water is, of course, gluten-free as well.

Other specialty ingredients can be used in gluten-free beers as long as the proper measures are taken to ascertain their purity. All manner of fruits and vegetables are gluten-free in their natural state, as are all unadulterated herbs and spices. Pure honey and other brewing sugars are appropriate, such as molasses, Belgian candi sugar, treacle and corn sugar.

#### FIRE UP THE KETTLES!

After procuring and malting gluten-free grains, only a couple of differences in recipe formulation and the brewing process need to be addressed. Because the malted grains are homemade, their yields will most likely be lower than commercial malts; therefore, you'll need to increase the amount of grain to achieve the desired gravity. You'll have to experiment to determine the appropriate levels, but a 25-percent increase in whatever base malt is being used is a good starting point.

When milling gluten-free grains, consider the differing kernel sizes. A roller mill with an adjustable gap is a big advantage. Depending on the residual moisture and the kilning levels, some grains may benefit from being double milled. Because many gluten-free grains lack husk, you'll notice a larger amount of fine flour generated during milling. You may need to screen the resulting grist before use to remove the finest dust, depending on your brewing system's tendency toward stuck mashes. Tempering the grain (incorporating small amounts of water to the whole grain 24 hours prior to milling) may also be of some benefit.

Because the grains used in gluten-free brewing are naturally lower in enzyme content, you'll need to extend the mash time

## AMERICAN STANDARD LAGER

### Ingredients for 5 U.S. gal (19 L)

- 7.0 lb (3.2 kg) white sorghum malt
- 3.0 lb (1.4 kg) flaked rice
- 1.0 lb (0.45 kg) flaked corn
- 1.0 oz (28 g) Tettnanger whole hops, 3.3% AA (90 min)
- 1 tsp (4.9 ml) Irish moss (15 min)
- 1.0 lb (0.45 kg) light brown sugar (1 min)
- 1.5 lb (0.68 kg) honey (1 min)
- White Labs WLP940 Mexican lager yeast (or lager yeast of your preference)
- 3.6 oz (102 g) corn sugar (to prime)

- OG: 1.045<sup>1</sup> (11.2° P)
- FG: 1.010<sup>1</sup> (2.6° P)
- Boiling time: 90 min
- IBUs: 15
- Color: 5-10 SRM<sup>2</sup>
- <sup>1</sup> dependent on the quality of malt and mash conversion efficiency
- <sup>2</sup> dependent on degree of malt kilning
- Primary fermentation: Two weeks at 46-58° F (8.9-14.5° C)
- Secondary fermentation: Two weeks or more at 32-40° F (0-4.5° C)

#### Brewer's Specifics

Mash grains at 150° F (66° C) for one to three hours or until starch conversion is complete. Conduct single- or multi-step decoction if desired. Add hops, Irish moss, honey and brown as directed. Perform a diacetyl rest after primary fermentation is complete, then transfer to secondary and lager for two weeks or more. Bottle or keg.

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## BELGIAN MILLETBIER (GLUTEN-FREE WITBIER)

### Ingredients for 5 U.S. gal (19 L)

- 9.0 lb (4.1 kg) white sorghum malt
- 2.0 lb (0.9 kg) unmalted white millet
- 1.0 oz (28 g) Saaz whole hops, 3.5% AA (60 min)
- 1.0 lb (0.45 kg) light Belgian candi sugar
- 1.0 oz (28 g) coriander (0 min)
- 0.75-1.0 oz (21-28 g) sweet orange peel (0 min)
- Wyeast 3944 Belgian Witbier (or appropriate white beer yeast)
- 4.2 oz (119 g) corn sugar (to prime)

- OG: 1.050<sup>1</sup> (12.4° P)
- FG: 1.012<sup>2</sup> (3.1° P)
- Boiling time: 75 min
- IBUs: 16
- Color: approx. 4 SRM<sup>2</sup>
- <sup>1</sup> dependent on the quality of malt and mash conversion efficiency
- <sup>2</sup> dependent on degree of malt kilning
- Primary fermentation: Two weeks at 62-75° F (16.7-24.9° C)

### Brewer's Specifics

Grind millet fine. Reserve a handful to add to the boil. Mash grains at 152-154° F (67-68° C) for one to three hours or until starch conversion is complete. Boil for a total of 75 minutes, adding reserved millet flour at the beginning of the boil and the hops at 60 minutes. Add candi sugar near the end of the boil. Add crushed coriander and orange peel at knockout and steep while cooling wort. Ferment at 62-75° F (17-24° C) then bottle.

to obtain the greatest possible yield. Multi-step infusion mashes are beneficial, as are decoction mashes. If a large proportion of the grain bill is unmalted grain, you'll need to liquefy the starches in a cereal cooker prior to adding them to the mash tun. I recommend frequent iodine testing during the main mash to verify complete starch conversion.

It is also a good idea to monitor the gravity of sparge output. Prevent the extraction of excess tannins and husky off-flavors by making sure the sparge gravity doesn't get too low. Since the extract potential of the gluten-free grain may not be precisely known, it is better to cut off the sparge early and add water to the boil kettle. Extended boil times for gluten-free beers can add needed color and increase melanoidin production, which benefits malty flavor and aroma.

With the exception of the steps mentioned above, brew day for a gluten-free beer should proceed much like any other beer. Take extra care to prevent contamination from gluten sources. Standard brewing sanitation practices should be enough to prevent such cross-contamination.

### THE RESULTS, PLEASE

Brewing a gluten-free beer progressed much as one might expect. Early batches showed promise that brewing with unusual ingredients was possible, but the beers themselves were lackluster and weak. These early brews fell short in gravity because of poor mash extraction and lacked the malty character gained from better quality malts. During the course of more than a dozen trials, the overall beer quality increased dramatically. I've tested various lager and ale recipes with great success. The best lager styles so far tend toward the pre-prohibition American-style and the Mexican/Vienna-style beers. I've also replicated faux hefeweizen and wit beers, as well as hoppy English and American pale ale varieties. In future experiments I'll tap more exotic grains such as teff, amaranth and quinoa in small quantities for unique flavor and aroma blends.

Before the project began, there was almost a complete lack of information on this subject of gluten-free brewing. I decided early in the project to publish all experimental findings on the Internet in an effort to generate more interest in gluten-free beer. The response from people with celiac disease worldwide, and others generally interested in the subject, has been overwhelming. The daily influx of queries concerning the availability of a commercial gluten-free beer reinforces that there is a market for such a product.

GRAINS ARE THE MAJOR STUMBLING  
BLOCK IN BREWING A GLUTEN-FREE BEER.  
YEAST PRESENTS THE ONLY OTHER  
SIGNIFICANT HURDLE, BUT WITH SOME  
FORETHOUGHT AND CARE, ALL COMMONLY  
AVAILABLE YEAST STRAINS CAN BE USED.

For the homebrewer, the challenge of crafting a fine gluten-free beer, or any unique and unconventional brew, has less to do with the lack of appropriate ingredients and more to do with lack of imagination. Open your mind, and your brew pot will follow.

### ADDITIONAL RESOURCES

Gluten-free Brewing

[www.glutenfreebeer.com](http://www.glutenfreebeer.com)

Celiac Disease & Gluten-free Diet Support Page

[www.celiac.com](http://www.celiac.com)

White Sorghum

[www.twINVALLEYMILLS.com](http://www.twINVALLEYMILLS.com)

With a penchant for brewing on the fringe, Sean Sweeney began his fermentation odyssey 15 years ago with dorm-room meads. Never one to color inside the lines, his beer brewing endeavors have earned him the reputation in the St. Louis Brews and First Capital Brewers as the one to go to with questions concerning unconventional brewing ingredients and techniques. His forays into hop gardening, homemade malts and many adventures into regional, indigenous, classic, historic and ancient brewing are only occasionally interrupted by his day job of performing surgery on all silicon-based lifeforms and therapy for those who use them. ☞



# For Geeks Only

**Reader Advisory: Warning!** These pages are rated XG (eXtra Geeky) by the Bureau of Magazine Mucktymucks. Items in this section may contain raw data, graphic functions, full statistics and undiluted biochemistry. Keep away from poets, squeamish novices and others who may find the joyously technical nature of this prose to be mindbendingly conceptual or socially offensive. Also, because of the complex nature of brewing science, there is no guarantee that you will live longer, brew better or win any awards in the next homebrew competition based upon the conclusions presented here.

## Thermal Response of Beer in Glass Carboys – Part II

By Steven Gardner, Ph.D.

*Please note: to improve readability of this article we have suspended our normal policy of placing the Celsius temperature equivalent after each Fahrenheit temperature mentioned. Instead, we have included a sidebar giving relevant temperature conversions.*

In the last issue of *Zymurgy* (Vol. 25, No. 5), we described the observations and calculations used to derive an equation describing the cooling of wort or beer in a glass carboy. The equation describes how the beer's temperature ( $T$ ) changes with respect to time ( $t$ ) based upon the starting ( $T_0$ ) and surrounding temperatures ( $T_\infty$ ). In this article, we will examine practical applications of this equation for the average brewer. That equation is:

$$T = (T_0 - T_\infty) e^{-0.1(t)} + T_\infty \quad (1)$$

The utility of this equation may be demonstrated in several ways. As an example, consider the case in which it is desired to cool the beer to a certain temperature in a specified time. Equation (1) effectively dictates the temperature gradient that must be imposed on the beer to achieve the desired result. Diacetyl rests are commonly employed when brewing lagers. Equation (1) may be used to define the temperature gradient needed to map out a specific time-

temperature excursion. Finally, consider the process of decreasing a beer's temperature in preparation for lagering. The rate of temperature decrease should generally not exceed  $1^\circ \text{F}$  per hour, otherwise the yeast may excrete flavors (e.g., sulfurs) into the beer<sup>1</sup>. Equation (1) may be used to help ensure that this prescribed rate of temperature change is not exceeded.

A particularly useful form of Equation (1) expresses the time required to reach some percentage of the temperature change between  $T_0$  and  $T_\infty$ . Recall that the difference between  $T_0$  and  $T_\infty$  represents the driving force for temperature change. The result is a simple constant that inherently depends upon the thermal response parameter  $z$ . In the present case, for example, the time required for the beer to complete 99 percent of the path between  $T_0$  and  $T_\infty$  is about 46 hours. The significance of this result is important to realize because it does not depend upon the actual difference between  $T_0$  and  $T_\infty$ . Regardless of the imposed temperature gradient, it will take the beer approximately 46 hours to make 99 percent of the change between its initial temperature ( $T_0$ ) and the imposed ambient temperature ( $T_\infty$ ) in the carboy systems of this study.

Whereas Equation (1) has many practical uses, there are instances where its

applicability may provide only approximate temperatures at best. The examples cited above correspond to periods during which there is a negligible heat effect from fermentation. Beer fermentation by brewer's yeast is an exothermic process. As the fermentation cycle progresses, heat would be generated in a manner dependent upon, for example, the particular yeast strain, the beer's composition as well as the beer's temperature. Equation (1) does not account for such heat generation effects, and therefore its applicability should be constrained to periods where there is little or no visible yeast activity. As the heat from fermentation increases, there would be an increasing element of error in estimating the corresponding temperatures using Equation (1). More information regarding fermentation exotherms is available from the investigations by Ruocco *et al*<sup>2</sup>.

Finally, some examples are given below that demonstrate some practical applications of Equation (1) and its various forms.



**Are You A Geek Too?** *Zymurgy* is looking for contributions for the "For Geeks Only" section. If you have studied a particular area of brewing science using in-depth library research or experimental data and would like to see the results published here, let us know by contacting Ray Daniels at [ray@aob.org](mailto:ray@aob.org) or via the mail address listed in the masthead on page 4.



### Example 1: Temperatures at Stated Times

Consider 5 gallons of beer that have just been placed in a 7-gallon glass carboy for fermentation. The carboy is subsequently transferred to a refrigerator which is regulated at an average temperature of 48° F. The initial temperature of the beer is 65° F. Estimate the beer's temperature after (a) 8 hours, (b) 24 hours and (c) 36 hours.

Substituting the given temperature information into Equation (1) yields:

$$T = (65^{\circ}\text{F} - 48^{\circ}\text{F}) e^{[-(0.1)t]} + 48^{\circ}\text{F}$$

Time  $t$  is expressed in hours, so we can easily make one substitution to solve these three problems. For the individual times, the corresponding temperatures are:

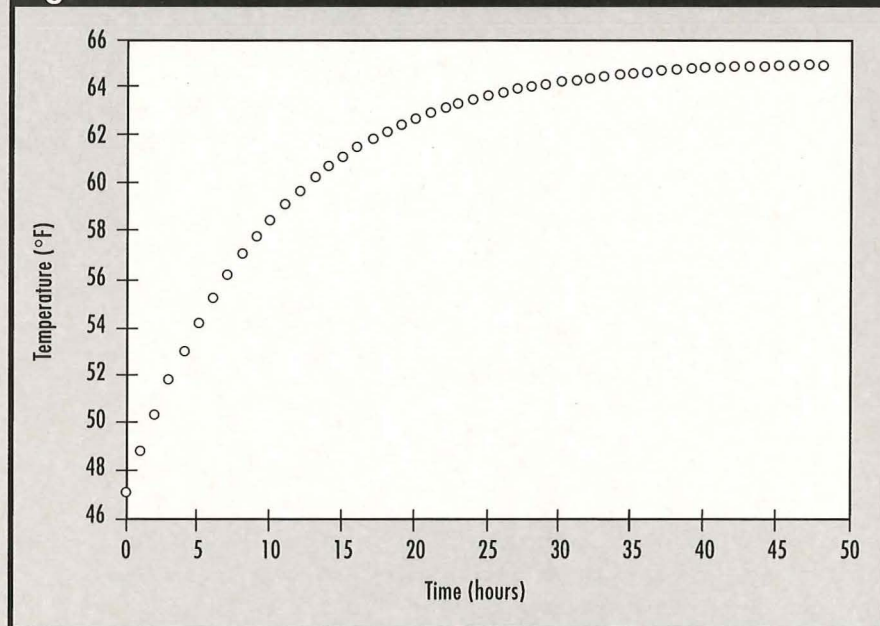
$$(a) \ T = (65^{\circ}\text{F} - 48^{\circ}\text{F}) e^{[-(0.1)(8)]} + 48^{\circ}\text{F} \approx 55.6^{\circ}\text{F}$$

$$(b) \ T = (65^{\circ}\text{F} - 48^{\circ}\text{F}) e^{[-(0.1)(24)]} + 48^{\circ}\text{F} \approx 49.5^{\circ}\text{F}$$

$$(c) \ T = (65^{\circ}\text{F} - 48^{\circ}\text{F}) e^{[-(0.1)(36)]} + 48^{\circ}\text{F} \approx 48.5^{\circ}\text{F}$$

This particular example demonstrates that most of the temperature change will occur during the initial few hours for the carboy systems examined in this study. As time increases, the beer's temperature

Figure 1



**Figure 1. A plot of the temperature-time excursion described in Example 3. The data predict how a beer's temperature (initially 47° F) will change when the carboy ambient temperature is suddenly increased to 65° F. This scenario would be typical of the early stages of a diacetyl rest.**

will asymptotically approach the ambient temperature. Note that the solution given here does not acknowledge heat that would be evolved from the onset of fermentation. As fermentation becomes more vigorous, the actual temperature of the beer would begin to deviate from the predicted values based on Equation (1).

### Example 2: Time to Reach Stated Temperatures

Consider a variation of the case described in Example 1. Using the same initial conditions, predict the time required for the beer to reach (a) 60° F, (b) 55° F and (c) 50° F.

Solving Equation (1) for time  $t$  yields:

$$t = (-10) \ln [(T - T_{\infty}) / (T_0 - T_{\infty})] \text{ hours} \quad (2)$$

where  $\ln$  is the natural logarithm.

Substituting values from the problem statement:

$$(a) \ t = (-10) \ln [(60^{\circ}\text{F} - 48^{\circ}\text{F}) / (65^{\circ}\text{F} - 48^{\circ}\text{F})] \approx 3.5 \text{ hours}$$

$$(b) \ t = (-10) \ln [(55^{\circ}\text{F} - 48^{\circ}\text{F}) / (65^{\circ}\text{F} - 48^{\circ}\text{F})] \approx 8.9 \text{ hours}$$

$$(c) \ t = (-10) \ln [(50^{\circ}\text{F} - 48^{\circ}\text{F}) / (65^{\circ}\text{F} - 48^{\circ}\text{F})] \approx 21.4 \text{ hours}$$

### Example 3: Warming Up for Diacetyl Rest

Consider a lager (5 gallons) that has completed the primary stages of fermenta-



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tion and is now ready for a diacetyl rest. Since the refrigerator's temperature has been controlled at 47° F and visible fermentation has been absent for two days, this may be assumed to be the beer's current temperature. Suppose the desired schedule for the diacetyl rest is 65° F for two days. If the refrigerator set point is adjusted to 65° F, how soon will the beer achieve the desired rest temperature? (Assume the refrigerator reaches the set point temperature of 65° F much faster than the time required for the beer's temperature transition.)

Equation (1) stipulates that 46 hours is required to transition 99 percent of the path between  $T_0$  and  $T_\infty$ . Recall that this result is independent of the difference between  $T_0$  and  $T_\infty$ . Therefore, it will take approximately 46 hours for the beer in this situation to equilibrate to 65° F. The entire temperature excursion can be estimated and plotted and the results are illustrated in Figure 1.

#### Example 4: Cooling at a Specified Rate

The diacetyl rest referenced in Example 3 is to be followed by a temperature reduction to 34° F for lagering. If the air temperature surrounding the beer is quickly reduced to 34° F, will the beer's rate of temperature reduction exceed the recommended maximum of 1° F per hour?

Note once again that it will take approximately 46 hours for the beer's temperature to decrease from 65° F to 34° F. This would correspond to an average rate of approximately 0.7° F per hour [(65° F - 34° F)/46 hours].

This would appear to satisfy the constraint of 1° F per hour. However, as reflected by the exponential nature of Equation (1), most of the temperature transition will occur during the first several hours. This is illustrated in Figure 2 which shows that the beer's temperature will decrease from 65° F to 37° F during the initial 24 hours. During the remaining 22 hours, the temperature would decrease by only about 3° F. In fact, the initial temperature reduction rate in Figure 2 is near 3° F per hour—well in excess of the desired 1° F per hour target.

If Equation (1) is expressed in terms of  $T_\infty$ , one may estimate the appropriate refrigerator set point to achieve the desired cooling rate:

$$T_\infty = \frac{T - T_0 e^{[-0.1(t)]}}{1 - e^{[-0.1(t)]}} \text{ F} \quad (3)$$

In this case, the time  $t$  would be 1 hour,  $T_0$  would be 65° F and  $T$  would be 64° F. Substituting these values into Equation (3) yields 54.5° F which is essentially 55° F. Therefore the temperature reduction rate of 1° F per hour will be exceeded if the temperature driving force itself ( $T_0 - T_\infty$ ) is greater than about 10° F. In order to carry out the entire temperature reduction from 65° F to 34° F, the refrigerator set point would need to be reduced (stepwise) in intervals such that the ambient air temperature remains within 10° F of the beer's temperature.

The graph in Figure 3 illustrates one possible way to complete the temperature reduction cycle. In this case, the refrigerator set point is reduced 10° F every 12 hours until the target temperature of 34° F is achieved. The crests in the curve correspond to the temperature set point changes. The first crest occurs at 12 hours at which time the beer temperature  $T$  has decreased from 65° F to 58° F. The refrigerator set point is then reduced from 55° F to 48° F (i.e., 58° F - 10° F = 48° F). Dur-

ing the next 12 hours the beer's temperature falls to 51° F. At this stage, the refrigerator set point is reduced from 48° F to 41° F. (Again, note that the set point temperature remains within 10° F of the current beer temperature.) The third and final crest in Figure 3 represents the final set point temperature adjustment. At this stage (36 hours total), the beer temperature is 44° F. So it turns out that a 10-degree set point reduction corresponds exactly to 34° F (the target). Therefore, during the final stage of

**Temperature Conversion Chart**

°F	°C	°F	°C	°F	°C
32	0	47	8	62	17
33	1	48	9	63	17
34	1	49	9	64	18
35	2	50	10	65	18
36	2	51	11	66	19
37	3	52	11	67	19
38	3	53	12	68	20
39	4	54	12	69	21
40	4	55	13	70	21
41	5	56	13	71	22
42	6	57	14	72	22
43	6	58	14	73	23
44	7	59	15	74	23
45	7	60	16	75	24
46	8	61	16		

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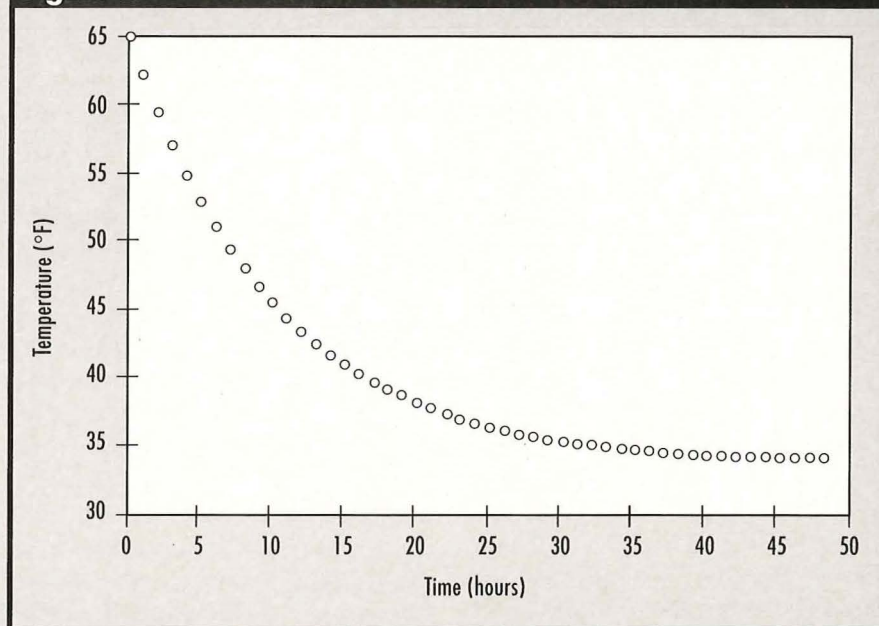
the cooling process, the refrigerator remains at 34° F. (If the beer temperature had been within 10° F of 34° F during the last set point adjustment, then the final set point temperature would have simply been 34° F.) The total cooling time in this case is approximately 60 hours, and the beer's temperature reduction rate never exceeds the prescribed 1° F.

## References

1. Lyn Kruger in the 65<sup>th</sup> Short Course in Brewing Technology, Vol. 1, Sec. 24: The Control of Fermentation and Flavors, Siebel Institute of Technology, Chicago, May 1998.
2. J.J. Ruocco, R.W. Coe and C.W. Hahn, *MBAA Technical Quarterly*, Vol. 17(2) (1980) p. 69.

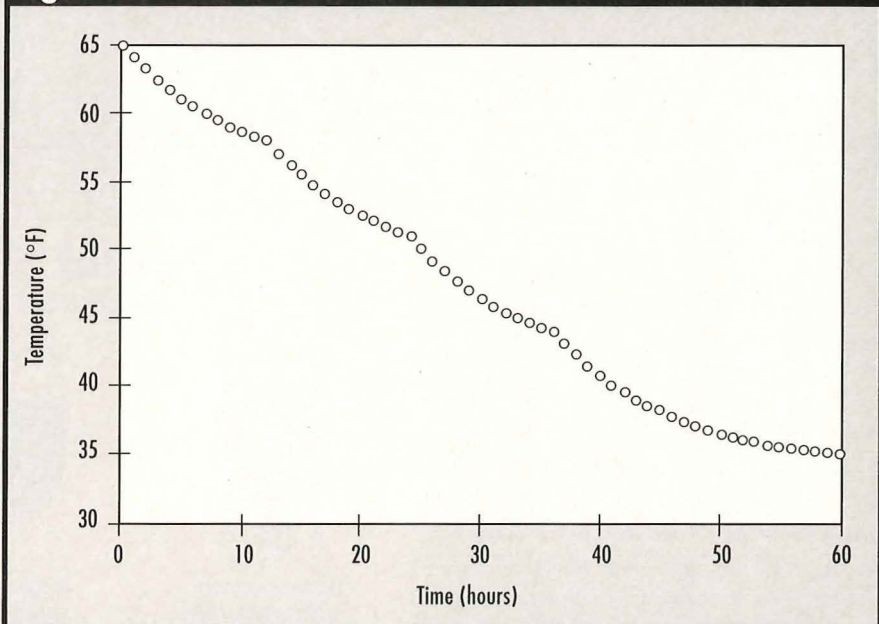
Steven Gardner holds a Ph.D. in chemical engineering from the University of Florida. A Siebel graduate and veteran homebrewer, he works by day as an R&D process engineer at Millennium Specialty Chemicals, a manufacturer of flavor and fragrance compounds in Jacksonville, Fla.

**Figure 2**



**Figure 2. The predicted thermal path for five gallons of beer in a glass carboy whose ambient temperature is suddenly reduced from 65° F to 34° F. The data illustrate that 50 percent of the beer's temperature reduction is predicted to occur within approximately seven hours of the transition.**

**Figure 3**



**Figure 3. A thermal cycling strategy for a beer whose temperature reduction from 65° F to 34° F is constrained to 1° F per hour. The graph is comprised of four discrete thermal cycles. Each cycle (i.e., each concave section) corresponds to a temperature reduction subject to an imposed temperature driving force ( $T_0 - T_\infty$ ) that remains less than 10° F. The three crests correspond to the three adjustments to the refrigerator set point temperature.**



BY CHARLIE PAPAZIAN

# Who's Cutting the Cheese, and Akka Lakka Pale Ale

Looking back at nearly 25 years of writing this column I am beginning to realize that in some ways this wonderful World of Worts is reflective of my friends, travels and activities over the years. So in this installment I'm reflecting on recent "What's new?" and "Where have you been?" inquiries of my life.

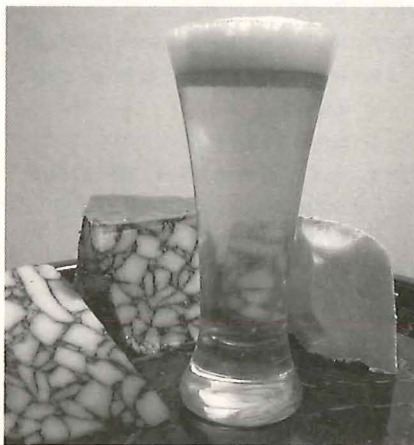
I just returned from a summer vacation in Maine to attend a reunion, serving my newly formulated Akka Lakka Pale Ale. More on that later.

Meanwhile a rather friendly package of cheeses was recently sent to my attention for tasting and matching with beer types. I'm involved with presenting a workshop at an international event in Italy featuring American and Irish cheese matched with American craft beers. The pre-tasting session was quite delicious and interesting. I got so excited about the cheese and beer tasting experience that I want to share it with *Zymurgy* readers.

Essentially the play of contrast and complement with cheese and beer is so sensational, it opens another world of thinking about beer and food. I was involved with an exotic cheese and beer workshop four years ago and my interest was refreshed by an excellent presentation by Brooklyn Brewing Co.'s head brewer Garrett Oliver. I encourage you to match interesting cheeses with your homebrew at your next gathering of friends. Here are my notes on the cheeses and the beers (and beer types) I recently had the pleasure of experiencing.

**Cheese:** St. Killian, a Camembert-style cheese made by Durrus Farmhouse Cheese Company, West Cork, Ireland. Pasteurized cow's milk cheese. Flavor of cheese: Complex, earthy, very rich, creamy, salty, subtle ammonia-like aftertaste.

**Beer:** Stone Brewing Company's IPA. St. Killian is perhaps the most assertively flavored of all six cheeses I tasted. The cheese is rich. Stone's IPA provides an assertive flo-



**The play of contrast and complement with cheese and beer opens another world of thinking about food and beer.**

ral and hop flavor counterpoint, cleansing the palate of the rich flavored cheese, enabling a return to the cheese and a return to the beer.

**Cheese:** Camembert, Isigny Ste Mere from Normandy, France. This is a complex, soft cheese that is not as salty and rich as St. Killian. Instead, it's a lower-intensity version that develops its own character as it lingers on the palate.

**Beer:** Odell's Easy Street Wheat. Easy Street Wheat is a light ale with a delicate, floral citrus note that provides an excellent counterpoint after the medium richness of Camembert.

**Cheese:** Corleggy. Corleggy Cheese Co., Ireland. Raw milk aged goat cheese. This cheese offers a deep, complex, mellow, nutty character with subtle hints of coconut that really pleases the palate. It does not demand attention, but its nuances are complex. Relatively mild goat cheese flavor.

**Beer:** Left Hand Sawtooth Ale. This well-balanced pale ale provides a refreshing complement (as opposed to a counterpoint) to Corleggy. Sawtooth has hop and malt character and ale fruitiness. Its balance is

quite similar to the balance of flavors of Corleggy. A refreshing combination.

**Cheese:** Cypress Grove's Humboldt Fog, California. This wonderful soft goat cheese has a layer of ash separating curds and a mild mold coating. As it ripens it gets creamy along the edges. Mild goat flavor is pleasantly balanced with tangy, dry character.

**Beer:** Deschutes Black Butte Porter. The tangy, full flavor and dry character of the cheese becomes totally balanced on the palate with the mild roasted, cocoa, sweet, nutty and medium-bodied character of Deschutes Porter. The counterpoint refreshes the palate and rewards by enticing more tastes of cheese and more tastes of beer.

**Cheese:** Cahill Farm. Vintage Irish Cheese with Porter Cheddar, Limerick, Ireland. Pasteurized cow's milk cheese. Wow! What a cheese for beer lovers! This most unusual cheese has a fantastic appearance with swirls of dark Porter ale. The flavor is mild and cheddar-like with nutty dark porter ale overtones. In the mouth, it develops a mild yet complex character both demanding and inspiring attention. You can taste the porter but it doesn't take over. The texture is not that hard for a "vintage" cheese.

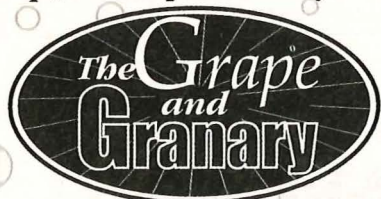
**Beer:** Brooklyn Brewing's Monster Ale. A vintage ale to go with a vintage cheese. This barley wine-style ale is rich and complex with fruity esters, complex malt and hop flavors and a symphony of alcohol flavors. Warming and vintage. Complexity of beer is harmonic with complexity of cheese.

**Cheese:** Grafton 4-year-old cheddar, Vermont. Deep complex flavor; nutty, tangy, not assaulting, not sharp. Rather mellow for an aged cheddar. Milk sugars somewhat crystallized, providing complexity to texture. A complex, aged cheese.

**Beer:** Brooklyn Brewing's Monster Ale. See reasons above: Big beer, big cheese.



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So there you have it. If you can get some of these cheeses, go ahead and provide your own matches. Looking for interesting cheeses? Remember the beer you enjoy is artisanal. The beer you brew is artisanal. Look for artisanal cheeses made by small producers both American and imported. You'll agree with me: this is fun!

Meanwhile, what about the beer—I mean the homebrewed beer. Akka Lakka Pale Ale was brewed this past summer as an original recipe to celebrate Pine Island Camp's 100<sup>th</sup> anniversary. I worked there for three summers in the Belgrade Lakes region of Maine from 1970–72. It was a great reunion of a lot of folks who influenced my life immensely. And it was quite satisfying to discover that some of those 8-year-old campers I counseled are now homebrewers themselves.

Akka Lakka ching. Akka Lakka chow. Akka Lakka ching ching chow chow chow. Boom-a-lakka, Boom-a-lakka. Chow, chow, chow. Pine Island. Pine Island. Rah, rah, rah.

Okay enough of my mature behavior (hey, I'm having fun). Let's cut the shuck and jive and get on with the recipe.

## Akka Lakka Pale Ale

A light, copper-colored pale ale having an unusual and pleasant twist of character provided by the Belgian special B malt.

**Ingredients and recipe for 5.25 U.S. gal. (20 L) for a yield of 5 gallons (19 L)**

- 1.0 lb (0.45 kg) pale malt
- 1.5 lb (0.68 kg) Munich malt
- 1.0 lb (0.45 kg) Vienna malt
- 0.75 lb (300 g) wheat malt
- 0.25 lb (110 g) Belgian Special-B malt
- 3.5 lb (1.6 kg) extra light dried malt extract
- 1 tsp (4 g) gypsum
- 1 oz (28 g) Amarillo (7 HBU/196 MBU) whole hops—60 minute boiling
- 0.5 oz (14 g) Horizon whole hops (5 HBU 140 MBU)—60 minute boiling
- 1 oz (28 g) Cascade hops—aroma hopping 3 minutes
- 0.25 tsp (1 g) powdered Irish moss
- 0.75 cup (180 ml measure) corn sugar (priming bottles) or 0.33 cups (80 ml) corn sugar for kegging English Ale type yeast

- **Target original gravity:**  
1.052–1.056 (13–14 B)
- **Approximate final gravity:**  
1.012–1.016 (3–4 B)
- **IBU's:** About 41
- **Approximate color:** 14 SRM (28 EBC)
- **Alcohol:** 5.2% by volume
- **Apparent yeast attenuation:**  
About 72%

A step infusion mash is employed to mash the grains. Add 4.5 quarts (4.3 liters) of 145° F (63° C) water to the crushed grain, stir, stabilize and hold the temperature at 132° F (53° C) for 30 minutes. Add 2 quarts (2 L) of boiling water and add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Then raise temperature to 167° F (75° C), laut and sparge with 2 gallons (7.5 L) of 170° F (77° C) water. Collect about 3 gallons (11.5 L) of runoff and add malt extract, gypsum and 60-minute hops and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 10 minutes (continued on page 61)



**Akka Lakka Pale Ale was brewed this past summer to celebrate Pine Island Camp's 100<sup>th</sup> anniversary.**

## HOMEBREW BITTERING UNITS

**(HBUs)** are a measure of the total amount of bitterness in a given volume of beer. Homebrew Bittering Units can easily be calculated by multiplying the percent of alpha acid in the hops by the number of ounces. For example, if 2 ounces of Northern Brewer hops (9 percent alpha acid) and 3 ounces of Cascade hops (5 percent alpha acid) were used in a 10-gallon batch, the total amount of bittering units would be 33: (2 x 9) + (3 x 5) = 18 + 15. Bittering units per gallon would be 3.3 in a 10-gallon batch or 6.6 in a five-gallon batch, so it is important to note volumes whenever expressing bittering units.

## INTERNATIONAL BITTERNESS UNITS

**(IBUs)** are a measure of the bitterness of a beer in parts per million (ppm), or milligrams per liter (mg/L) of alpha acids. You can estimate the IBUs in your beer by using the following formula:

$$\text{IBU} = \frac{(\text{ounces of hops} \times \% \text{ alpha acid of hop} \times \% \text{ utilization})}{\text{gallons of wort} \times 1.34}$$

Percent utilization varies because of wort gravity, boiling time, wort volume and other factors. Homebrewers get about 25 percent utilization for a full one-hour boil, about 15 percent for a 30-minute boil and about 5 percent for a 15-minute boil. As an example, 1 ounce of 6 percent alpha acid hops in five gallons of wort boiled for one hour would produce a beer with 22 IBUs:

$$\text{IBU} = \frac{1 \times 6 \times 25}{5 \times 1.34} = 22 \text{ IBUs.}$$

**METRIC BITTERNESS UNITS (MBUs)** are equal to the number of grams of hops multiplied by the percent alpha acid.



BY JIM HOMER

For this Winners Circle we bring you five beers that make great use of malt. All are strong beers that will warm you in the cold winter months ahead.

"Old Cirrhosis" was the first attempt at a barley wine for Steve Bagley and Milan McVay. They used a remarkable 21 pounds of malt for a 5-gallon batch! In the September/October *Zymurgy* we featured a gold-medal-winning specialty beer recipe from these same brewers.

Continuing with beginner's luck, we find that Glen Thomas won a silver for his first try at an ice bock. Glen also took silver this year for his Munich Dunkel.

The silver medal-winning oatmeal stout was the third try for Dave Corbett. For the second batch he backed off the hops. To win the silver medal with the third attempt he adjusted the chocolate malt and roast barley to balance with the hops.

Adam Drahushuk has been brewing a Belgian golden ale for three to four years. He was "playing around with the recipe" before he won the bronze with "Luciferous."

The recipe for "Polish Porter" in "Fred's Polish Sweetheart: Dojlidy Porter" by Amahl Turczyn (*Zymurgy*, May/June 2000) inspired Stan Holder to try a Baltic porter. Stan did some additional research, which included tasting some commercial examples. He reduced the strength of the recipe and came up with a winner.

## English-style Barley Wine



### BRONZE MEDAL

#### AHA 2002 NATIONAL HOMEBREW COMPETITION

Steve Bagley and Milan McVay, Medina, Ohio  
"Old Cirrhosis"

English-style barley wine

Ingredients for 5 U.S. gal (19 L)

- 14 lb (6.3 kg) Marris Otter pale malt
- 2 lb (0.9 kg) DeWolf-Cosyns Munich
- 3 lb (1.35 kg) DeWolf-Cosyns aromatic
- 2 lb (0.9 kg) Briess 80° crystal
- 3 lb (1.35 kg) M & F DME
- 1 tsp (4.9 ml) gypsum
- 4 oz (112 g) Horizon pellet hops, 11% alpha acid (60 min)
- 1 oz (28 g) Cascade pellet hops, 5.5% alpha acid (15 min)
- 1 oz (28 g) Cascade pellet hops, 5.5% alpha acid (2 min)
- 1 oz (28 g) Cascade pellet hops, 5.5% alpha acid (dry hop)
- Wyeast 1056 (American Ale yeast)
- 1 cup (237 ml) DME for starter
- 0.5 gal (0.23 L) starter

- Original specific gravity: 1.118
- Final specific gravity: 1.026
- Primary fermentation: 10 days at 62° F (17° C) in glass
- Secondary fermentation: 30 days at 62° F (17° C) in glass
- Other: 120 days at 34° F (1° C) in glass

### Brewer's Specifics

Mash all grains at 151° F (66° C) for 90 minutes. Boil for 90 minutes.

### Judges' Comments

"Raisin/rum/fruit, not quite cloying, chocolate. Nice complexity. Alcohol proud but not huge, finish just rolls on—wow. Slightly bitter."

"Seems too bitter for an English barley wine. The fruity flavors are quite pleasant. Nice job."

## Eisbock



### SILVER MEDAL

#### AHA 2002 NATIONAL HOMEBREW COMPETITION

Glenn Thomas, Raleigh, N.C.  
"Hawk Eis"

Eisbock

Ingredients for 4 U.S. gal (15.16 L)

- 7 lb (3.15 kg) Pils malt
- 0.5 lb (0.23 kg) wheat malt
- 2 lb (0.91 kg) Munich
- 2 oz (57 g) chocolate
- 1 lb (0.45 kg) 20° L crystal malt
- 2 oz (57 g) Hallertauer whole hops, 4.1% alpha acid (90 min)
- Wyeast 2206 (Bavarian Lager yeast)
- 1 qt (0.95 L) starter with dried malt extract
- 0.5 gallon (1.9 L) distilled water (after boil to adjust original specific gravity)

- Original specific gravity: 1.085
- Final specific gravity: 1.018 (before freezing)
- Final specific gravity: 1.022 (after removing ice)
- Primary fermentation: 14 days at 55° F (13° C) in glass
- Secondary fermentation: 42 days at 38° F (3° C) in glass

### Brewer's Specifics

Mash in at 121° F (49° C), a third of the mash pulled out and brought to 151° F (66° C) for 10 minutes, then boiled for 10 minutes and added back, bringing the full mash to 154° F (68° C) for 90 minutes. Mash out at 169° F (76° C). After secondary, place in freezer for 24 hours, remove ice.

### Judges' Comments

"Wonderful chewy, malty flavor with balancing hop bitterness. No hop flavor—OK. Alcohol a bit light for style but OK."

"Good fermentation characteristics. Just cut back a bit on the bittering hops."



## Oatmeal Stout



### SILVER MEDAL

AHA 2002 NATIONAL HOMEBREW COMPETITION

Dave Corbett, Milford, Conn.

### Oatmeal Stout

Ingredients for 6 U.S. gal (21.77 L)

- 11 lb (4.99 kg) Marris Otter pale ale malt
- 6 oz (170 g) British crystal 60° L
- 6 oz (170 g) British chocolate
- 0.75 lb (0.34 kg) roast barley
- 2 oz (57 g) Black Patent
- 0.25 lb (0.11 kg) flaked oats
- 1 tsb (4.9 ml) calcium carbonate
- 2 oz (57 g) Styrian Goldings hop pellets, 4% alpha acid (75 min)
- 0.5 oz (14 g) Styrian Goldings hop pellets, 4% alpha acid (30 min)
- Wyeast 1084 (Irish ale yeast)
- 0.5 C (118 ml) DME (for starter)
- 2 pt (0.95 l) starter

- Original specific gravity: 1.060
- Final specific gravity: 1.016
- Primary fermentation: 6 days at 64° F (18° C) in glass
- Secondary fermentation: 14 days at 52° F (11° C) in glass

### Brewer's Specifics

Mash grains 90 minutes at 154° F (68° C). Yeast starter stepped up two times.

### Judges' Comments

"Roasted malt up front, good support from the malt sweetness, bitterness balances a bit too dry, finishes clean."

"Very good shot at style, a bit more sweetness would dial it in. Try mashing a couple of degrees higher."

"Malty sweetness, roasted malt, coffee-like flavor, finishes with a slight dryness, some fruitiness well balanced toward malt."

"Nice complexity, starts out with a slight sweetness and finishes somewhat dry, well-balanced interesting beer and fun to drink."

## Belgian Strong Golden Ale



### BRONZE MEDAL

AHA 2002 NATIONAL HOMEBREW COMPETITION

Adam Drahushuk, Collegeville, Pa.

### "Luciferous"

### Belgian strong golden ale

Ingredients for 12.5 U.S. gal (47.37 L)

- 25 lb (11.25 kg) Pilsner (Weissheimer)
- 4 lb (1.81 kg) Briess flaked barley
- 5 tsp (24.6 ml) CaCl<sub>2</sub>
- 5 lb (2.27 kg) sucrose
- 4 oz (113 g) Tettnang pellet hops, 5.6% alpha acid (60 min)
- 1 oz (28 g) coriander seed slightly ground in coffee grinder (15 min)
- 0.035 oz (1 g) Grains of Paradise slightly ground in coffee grinder (15 min)
- Wyeast 1214 (Belgian ale yeast)
- 0.5 gallon (0.23 L) yeast starter
- DME to bring starter to 1.040 to 1.050 gravity

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- 4 tsp (19.7 ml) Wyeast yeast nutrients
- 2 C (473 ml) corn sugar for priming

- Original specific gravity: 1.075
- Final specific gravity: 1.013
- Primary fermentation: 37 days at 68° F (20° C) in glass

#### Brewer's Specifics

Mash pilsner malt and flaked barley 1 hour at 150° F (66° C). Boil for 1 hour 15 minutes.

#### Judges' Comments

"Spicy, hoppy flavor supported by light malt. Balance toward bitterness but not too bitter for style. Finishes nicely dry."

"Slightly more malt character would ease the harshness."

## Experimental



#### BRONZE MEDAL

#### AHA 2002 NATIONAL HOMEBREW COMPETITION

Stan Holder, Wichita, Kan.

"Polski Porter"

Specialty, Experimental, Historical: Baltic Porter

#### Ingredients for 5 U.S. gal (18.93 L)

- 11 lb (4.99 kg) Pilsner malt
- 0.5 lb (0.23 kg) Munich malt
- 0.5 lb (0.23 kg) Cara Vienne
- 0.5 lb (0.23 kg) Special B
- 0.25 lb (0.11 kg) chocolate malt
- 1.5 oz (43 g) Hallertauer whole hops, 6.3% alpha acid (120 min)
- 0.5 oz (14 g) Saaz whole hops, 2.2% alpha acid (30 min)
- Wyeast 2206 (Bavarian Lager yeast)

- Original specific gravity: 1.082
- Final specific gravity: 1.020
- Primary fermentation: 14 days at 66° F (19° C) in glass

- Secondary fermentation: 14 days at 55° F (13° C) in glass
- Lager: 60 days at 36° F (2° C) in steel

#### Brewer's Specifics

Three steep mash; 40 minutes at 144° F (62° C), 40 minutes at 154° F (68° C), 20 minutes at 160° F (71° C). Carbon filter for brewing water. Force carbonate to 2.2 volumes CO<sub>2</sub>.

#### Judges' Comments

"Huge maltiness, balanced by a touch of toast. Finish drying out to soft roastiness. Just a hint of oxidation."

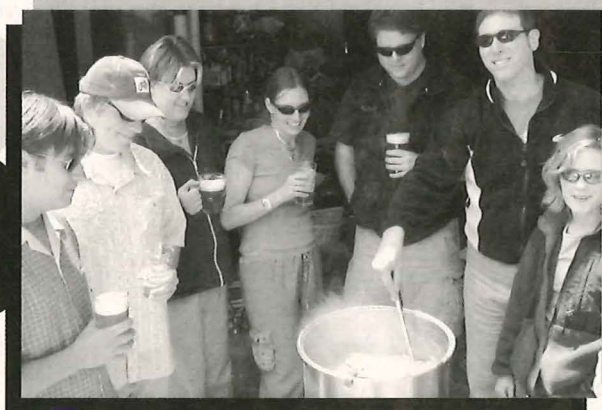
"Very nice beer. Hint of oxidation mars it a little. Delicious malty nose and flavor."

"Sweet malt up front, some chocolaty notes, caramel flavors."

Jim Homer is a national judge in the Beer Judge Certification Program. He joined the AHA in 1980 as member No. 763, and is a graduate of Charlie Papazian's homebrew class.

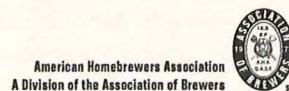
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**Dear Professor** (from page 21)

**In Search of Irish Red Ale**

Dear Professor,

I've tried several microbrew Irish red lagers, and they all seemed to have a common distinct flavor from German and American lagers. What's the key to this flavor? I've tried crystal malts, and hops such as Tettnanger and H. Mittelfruh, but I make beer that tastes like a Boston lager. I'm still using extracts. I can't duplicate this Irish red lager flavor. I've searched the Web for hours looking for recipes, and looked through multiple recipe books with no luck. It doesn't even seem to be a recognized style.

Sorry to bother you, but this is one time researching and using the Web has failed me. Any ideas? Thanks in advance.

Mike and Shelly

*Hi Mike, Hi Shelly,*

*You again. Here's an excerpt from the Association of Brewers' Beer Style Guidelines (of which many other styles can be found at [www.beertown.org/gabf](http://www.beertown.org/gabf)):*

*Irish-style red ales range from light red-amber-copper to light brown in color. These ales have a medium hop bitterness and flavor. They often don't have hop aroma. Irish-style red ales have low to medium candy-like caramel sweetness and a medium body. The style may have low levels of fruity-ester fla-*

*vor and aroma. Diacetyl should be absent. Chill haze is allowable at cold temperatures. Slight yeast haze is acceptable for bottle-conditioned products.*

*Original Gravity (° Plato):*

*1.040–1.048 (10–12° Plato)*

*Apparent Extract/Final Gravity (° Plato):*

*1.010–1.014 (2.5–3.5° Plato)*

*Alcohol by Weight (Volume):*

*3.2–3.6% (4–4.5%)*

*Bitterness (IBU): 22–28*

*Color SRM (EBC): 11–18 (22–36 EBC)*

*I don't know what you would be referring to as a "key" flavor. But if I were to guess it's the candy-like caramel sweetness in combination with a balance of ale fermented fruitiness. You'll achieve the fruitiness by choosing the correct yeast. And I'd start off with a pound of 10 to 15° L crystal malt and perhaps a third of a pound of Belgian aromatic malt in a 5-gallon batch to achieve that candy caramel balance in aroma and flavor. This should get you going in the right direction whether you are using extracts or all grains.*

*Irish isn't all green,  
The Professor, Hb.D.*

**Going for an Hb.D.**

Dear Mike,

As a final-year Industrial Design student at the University of South Australia, Adelaide, I have had to undertake a major design assignment consisting of everything from initial product research to making a final working prototype. As an avid homebrewer I have chosen to design a Homebrew Kit (30 liters). I am hoping to create a unique design that perhaps might address any problems with current design.

As an experienced person in this field I was wondering if you had any input, perhaps an idea you have or a problem with brewing that you would like addressed; or knew anyone that would like to help.

Any feedback would be very appreciated.

Cheers from Down Under,

Jarrod Carter

Adelaide, Australia

*Dear Jarrod,*

*Michael Jackson passed on your letter to me. I could be of some help, but there are already volumes written about homebrewing. There are probably millions of us experts scattered throughout the world. I'd really suggest connecting with some Australian homebrew shops and clubs of which there are several. But I'll warn you—"problems in design" are unique to each homebrewer. Everyone has priorities as to what they want out of a homebrewing system.*

*There are some mighty fine ones out there (several advertised in this magazine, Zymurgy). Cost, conveniences, volume, materials, brewing methods and brewing styles are just a few of the variables you will encounter. I think you'll find you can't please all of the brewers all of the time, but you can please them all with one good beer one at a time, no matter how it was brewed.*

*Good luck and see you at the next Hb.D. convention,  
The Professor, Hb.D.*

Hey homebrewers! If you have a brewing-related question for Professor Surfeit, Send it to "Dear Professor," PO Box 1679, Boulder, CO 80306-1679; FAX (303) 447-2825 or E-mail it to [professor@aob.org](mailto:professor@aob.org).



BY RAY DANIELS

## Take This to Your Doctor

Support for the health benefits of moderate drinking seems to be growing. A recent article on this trend appeared in the ever so un-trendy business daily *The Wall Street Journal* (August 13, 2002, Section B). The article quotes Norman Kaplan, professor of medicine at the University of Texas Southwestern Medical Center in Dallas. He cited a study of 70,000 nurses showing that moderate beer drinking resulted in less hypertension than did moderate consumption of either wine or spirits. Another study on more than 128,000 patients showed that men who drank beer were less likely than their wine and spirits drinking counterparts to have coronary-artery disease. Finally, he stated that beer drinking may increase bone density—a good reason to get the wife drinking some more of your brew!

Of course, the key as always is that word “moderate.” This article was not too far off most others that defined moderate drinking as “two 12-ounce servings of beer per day” for men and just one for women. The health effects of overdoing it outlast the inevitable hangover with possible increased risk of liver disease, stroke and certain cancers. Most experts also note that the benefits do not justify the conversion of non-drinkers to tipplers.

## How Evil is This?

Good news: Your commuter train now stocks good beer to make a two-hour trip more enjoyable. Bad news: No bath-

room on the train. That’s the story coming from Japan where the Friday night Fuji Kyuko train now serves “as much locally brewed beer as [passengers] can drink,” according to a recent report by Reuters news service. Apparently the train does make some stops at stations with restrooms—but no information is provided on whether the stops are actually long enough for a, uh, beer run.



## Moose Attack Topples Craft Beer

A battle between moose has ended in a devastating loss for the smaller of the two.

Moosehead Brewers Ltd. of New Brunswick, Canada has succeeded in wresting away the U.S. trademark issued in 1992 to Grand Teton Brewing Co. (previously Otto Brothers Brewing).

The affected brand is Moose Juice Stout, one of five products bottled by Grand Teton. The affected beer is a GABF Silver Medal winner and a multiple winner at regional competitions. The trademark for Moose Juice Stout, applied for in 1991 and approved in 1992, was canceled by the U.S. Trademark Appeals Board in June of this year. This follows a lengthy five-year legal battle based on Moosehead’s claim to the word “Moose” worldwide.

Charlie Otto, founder of Otto Brothers and Grand Teton Brewing, has been in the beer business since 1988. “I never dreamed

it was possible,” said Otto, learning of the cancellation of the trademark and the impending cease and desist order. “I believed that if you were issued a U.S. trademark it was yours. We built our company on the assumption that once a mark was issued you had the freedom and go-ahead to grow that brand.”

Otto said that his company had never compared its beer, which is a stout, to the well-known Canadian lager. “We are a true handcrafted regional microbrewer. We’re the little guys being shut down by a monster-sized corporation. It makes no sense and I wonder, who’s next?”

As a result of these events, Grand Teton plans to discontinue production of its award-winning stout.

## A “Loft”-y Ingredient: Kaffir Leaf

The creative folks at New Belgium Brewing Co. found a beer ingredient they’d never heard of before and—just like a giddy homebrewer—had to use it in a beer. The novel herb is kaffir leaf, an ingredient that comes from a particular Asian lime tree.

Popular in Thailand, kaffir lime leaves give a characteristic flavor to soups, stir-frys and curries. Thai cuisine

often combines kaffir lime with garlic, galanga, ginger and fingerroot, together with a liberal amount of chiles. Kaffir lime has a characteristic fragrance described as “strongly lemon-like” but difficult to reproduce or replace with other herbs or spices.

New Belgium’s Loft delivers “an uplifting zest, a taut hoppiness produced by Sterling and Liberty hops, and a mouth feel as big as the sky,” according to the company’s



NEXT BATHROOM  
200 MILES



press release. Kaffir leaf is pitched in the kettle to create a pleasantly refreshing citric nose. NBB recommends the new beer for pairing with spicy Thai dishes, kite-flyin' and backyard bocci ball.

### New Book Covers Quality in Brewing

Brewers Publications, a division of the Association of Brewers, recently released *Standards of Brewing*, a title by Charles Bamforth Ph.D., D.Sc. that guides brewers through processes of making consistent, high quality beer. Bamforth is the Anheuser-Busch Endowed Professor of Malting and Brewing Sciences at University of California, Davis.

In *Standards of Brewing*, Bamforth introduces modern brewers to the statistical quality-control concepts that were originally pioneered in the brewing industry. Bamforth then goes beyond these concepts, giving real-world brewery examples in a light, often humorous style. Finally, the book reviews each aspect of brewery operations with recommendations on what sort of sampling and testing should be done and which tests will be of greatest value. Most homebrewers don't work with much of the technology covered in the book, but the guiding principles of quality can be applied to any beer production setting.

For more information or to order *Standards of Brewing*, call the Association of Brewers at 303-447-0816 or 888-822-6273. Visit [www.beertown.org](http://www.beertown.org) to read more about *Standards of Brewing*.

### Kirin Tackles Ancient Recipe

Imagine being presented with a beer that has no head, no hop character, a dark tea-like color and 10 percent abv. Actually, that may not sound so strange to homebrewers, but for one of the world's biggest brewers, it is quite a departure from the norm.

Kirin brewery, producer of the most popular beer in Japan for 48 years, also distributes beer in the U.S. through an alliance with Anheuser-Busch. But recently Kirin took a rather large departure from its usual light lager brewing to develop a robust ancient beer based on Egyptian hieroglyphics. Unfortunately Kirin's bold brewing adventures will only go so far: the beer will not be sold commercially. As of this writing the only time it will be served beyond the brewery will be the Master Brewers Association of the Americas annual conference in Austin, Texas in October.

Other brewers including Scottish and Newcastle and Anchor Brewing have made similar beers over the years. Recently a bottle of S&N's Tutankhamen Ale fetched \$75 in an auction.

### Pyramid Ponders: To Rake or Not To Rake?

The arrival of autumn brings falling leaves and the annual conundrum. This year, Pyramid Ales & Lagers delivers a



rake that's somewhat more inviting to pick up: Pyramid Broken Rake Amber

Ale. Those looking to put off their fall chores and relax will find that this broken rake is a hearty fall beer.

"Broken Rake is the perfect autumn companion," remarks Pyramid brewer Simon Pesch. "Deep copper in color, its noble hop finish elegantly balances the assertive malt overtones, resulting in a hearty and rewarding full-flavored beer."

### Crisp Buys Alloa Maltings Site

Crisp Malting Group, a wholly owned subsidiary of Anglia Maltings (Holdings) Ltd., purchased the Alloa Maltings site from Coors Brewers Ltd. to add to its three U.K.



production sites. The recent acquisition of John Hare and Corp. Ltd by CMG's sister company, EDME Ltd., is part of Anglia's

long-term growth strategy.

"This acquisition is part of CMG's current significant expansion and investment program in malt production, following major capital expenditure in our other Scottish Maltings at Portgordon and at both Great Ryburgh in Norfolk, and Ditchingham in Suffolk," says Euan Macpherson, group managing director. "The Alloa Malting Plant is ideally placed to supply new and existing customers in Scotland and overseas."

The Alloa plant purchase makes Crisp the leading independently owned U.K. maltster, with worldwide sales in excess of 215,000 tonnes per year.

Ray Daniels is the editor-in-chief of *Zymurgy* magazine.

## GET BREWING!

First-round entries will be due in early April for the AHA National Homebrew Competition 2003. Get your best recipes together and go head-to-head with the rest of the best. Watch the next issue of *Zymurgy* or check out the complete information, entry forms and rules on the AHA website at:

[www.beertown.org/AHA/index.htm](http://www.beertown.org/AHA/index.htm)



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
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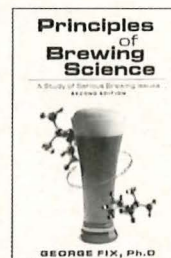
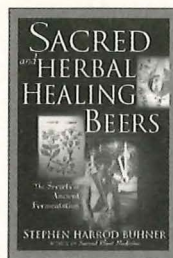
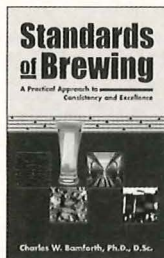
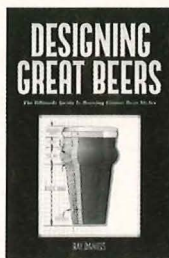
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**Homebrew And Beyond** (from page 7)  
stronger sample,” he said, looking at Simon. Relieved to be saved from the ignominy of a shutout, I immediately agreed.

We took a short break while Simon did some more doctoring of the beer and then carried on as before. Even at the higher concentration, detection of the off-flavors was difficult. Simon used a very light base beer—and because the base beer is light, the off-flavors are, too. Accustomed to much bigger, more flavorful craft- and homebrewed-beers, I found it tough to pick out the flaws. Fortunately, Jim did too.

I tasted intently and eventually ticked off three or four flavors, erased one or two and added others as my perceptions and analysis changed. In the end, I wasn’t good enough; Jim won.

I was pleased for Jim of course—he did a great job and obviously has an excellent palate. But I must say that the rewards for first and second place seemed ironic. He received one of FlavorActiv’s Enthusiast Beer Taste Troubleshooting Kits—a

resource worth \$150. Logically, being a less skilled taster and in need of more practice, I should have received two of these nice kits. Somehow that’s not the way things worked out.

In any case, the exercise pointed out one of several ways that you can use the FlavorActiv kit to help train your beer-tasting senses. The company has equipped AHA Liaisons with these kits so they can bring this resource to local clubs as a part of the effort to increase AHA membership. You can also snag a kit for your club to use at an upcoming meeting or event—just see the AHA section of [www.beertown.org](http://www.beertown.org). Finally, those who want to challenge themselves with a few questions about beer flavor and styles should head right to the FlavorActiv Web site at: [www.flavoractiv.com](http://www.flavoractiv.com). I won’t include the answers to the questions I mentioned above so no one can cheat.

Cheers!

**Ray Daniels avoids off-flavor beers when consuming beer and crafts strong, flavorful homebrews to hide any minor flaws that his own brewing technique might produce.** ☺

### **Extract Experiments** (from page 18) **Tasters’ Impressions**

Golden-amber beer. Good balance between malt and hop bitterness. An excellent session beer.

### **Frank Sobetski’s Baltic Porter**

#### **Ingredients for 5 U.S. gal (19 L)**

- 9.9 lb (4.5 kg) Munton’s Amber Extract
- 0.5 lb (0.23 kg) chocolate malt
- 1.0 lb (0.45 kg) German rauch malt
- 20 oz (0.59 L) real maple syrup (in with finish hops)
- 1.0 oz (28 g) Liberty hops (boil for 45 min)
- 1.0 oz. (28 g) Liberty hops (finish, last 2 min)
- 1.0 tsp (5 ml) Irish moss @ 15 min boil
- Wyeast 1187 Ringwood Ale 750 ml starter

- O.G.: 1.072 (17.5° P)
- F.G.: 1.017 (4.2° P)

#### **Brewer’s Specifics**

Steep grains for 20 minutes. Remove grains. Reheat wort. Remove from heat. Add extract and stir to thin. Return to heat, add bittering hops at beginning of boil. After 45 minutes add finishing hops and 20 ounces maple syrup. Chill wort. Add cold water to 5 gallons. Add yeast. Primed with 10 fluid ounces (0.3 L) maple syrup.

#### **Tasters’ Impressions**

Very dark beer with a garnet hue. Malty flavor, with slight maple and smoke undertones. Placed second in the historical category at AHA first round nationals.

#### **Conclusion**

The amber malt limited our choices on just what we could brew, but the club members formulated some interesting and tasty brews. It’s instructive to us old all-grainers to see what a really good beer can be brewed with an extract base.

**Jim Larsen is the OmaHops secretary and newsletter editor and has been brewing for 20 years. He lives in Omaha with his wife and teenage daughter.** ☺

### **It’s the Beer Talking** (from page 5)

My biggest and concluding notes of appreciation go to two members who are off the hook on Teach a Friend to Homebrew Day: Dave Dixon and Josanna Pociask. Dave and Josie will be betrothing that day in Las Vegas. (Dave, is that wedding still at the 24-hour drive-through Church of Elvis or did you move it?) Josie served on the AHA National Homebrewers Conference committee along with Steve Wesstrom, Mark Wedge, R.C. Bolander, Charlie Walker, Charlie Gottenkieny, J.B. Flowers, Tom Janik, Rett Blankenship and Jason Courtney. This motley but lovable crew was chaired by Dave Dixon, whose life became more difficult when the host hotel was bought and shut down 16 days before the conference, forcing us to find an alternative site. Thanks to the whole committee. This is a huge commitment and the conference was a great time yet again.

I hope you have a great holiday season filled with strong ale in your favorite glass, loved ones and comfortable slippers. See you in 2003.

**Paul Gatza is the director of the American Homebrewers Association.** ☺

### **World of Worts** (from page 49)

remain add the Irish moss. When three minutes remain add the aroma hops. After a total wort boil of 60 minutes turn off the heat and place the pot (with cover on) in a cold-water bath for 15 minutes. Then strain and sparge the warm wort into a sanitized fermenter to which you’ve added 2.5 gallons of cold water. Bring the total volume to 5.5 gallons (20 L) with additional cold water if necessary.

Pitch a good dose of healthy active ale yeast when temperature of wort is about 70° F (21° C), then primary ferment at temperatures between 65–70° F (18.5–21° C) for about four to six days. Rack from your primary to a secondary and let the yeast settle out for another week. Your net yield will be 5 gallons (19 L) to the secondary. If you have the capability, “cellar” the beer at about 55° F (12.5° C) for seven to 10 days.

Prime with sugar and bottle or keg when complete.

Akka Lakka!

**Charlie Papazian is the founding president of the Association of Brewers.** ☺



## Homebrew Clubs (from page 12)

TechTalk by sending an e-mail request to [moderator@aob.org](mailto:moderator@aob.org). Please include your name and membership number. TechTalk is a friendly daily e-mail forum where you can get answers to just about any homebrewing-related question you can come up with.

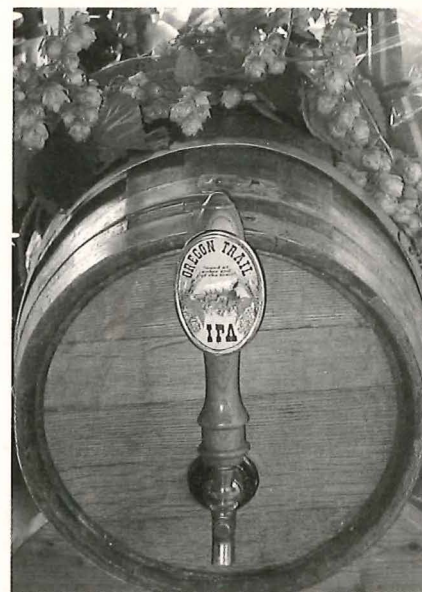
For more information on the Foam on the Range club, check out their Web site at [www.foamontherange.org/](http://www.foamontherange.org/).

## Teach a Friend to Homebrew Day

It's time to spread the love! Celebrate "Teach a Friend to Homebrew Day" Saturday, November 2 by showing friends and family how fun and easy it is to homebrew. Be sure to register your club's site at [www.beertown.org/AHA/](http://www.beertown.org/AHA/).

Gary Glass is the project coordinator for the American Homebrewers Association. When he isn't homebrewing he can be found working on his masters thesis in U.S. history.

## Last Drop (from page 64)



**Oregon Trail IPA (Corvallis, Ore.) Good at either end of the trail.**

## American Lager Club-Only Competition

The AHA thanks Dave Houseman and Beer Unlimited Zany Zymurgists (BUZZ) of Malvern, Pa., for hosting the American Lager Club-Only Competition held August 17, 2002. This was the first of six competitions in the August-to-May 2002-2003 cycle, with points going toward the Homebrew Club of the Year trophy. Points are awarded on a 12-8-4 basis for first, second and third place in the club-only competitions. First, second, and third places in the first and second rounds of the AHA National Homebrew Competition earn points on a six-four-two basis. The club whose members have amassed the most points over the year is crowned the Homebrew Club of the Year.

Of the 31 entries the winners were:

**First Place:** Steve Severtson representing James River Homebrewers of Richmond, Va.

**Second Place:** Shawn Scott representing the Fellowship of Oklahoma Ale Makers of Tulsa, Okla.

**Third Place:** Jack Sykes representing Kansas City Bier Meisters of Kansas City, Mo.

**Congratulations to all of the winners, and thanks to all of the club representative brewers who entered!**

hops nearly eight feet high. I think Rob and I would still be stuck in that hop pile if they hadn't kicked us out after about 20 minutes. And I'll tell you: it's amazing the nooks and crannies hop resin will work itself into!

Back at the festival, the band was in full swing with an open microphone, more barbecue and a few brew sessions still in progress. We wrapped up our own brew session and were able to sit back and just enjoy a few cold brews and survey the scene around us. Things began to wind down around midnight and a group of us headed off to a camping area for a bonfire, camaraderie and, of course, some more great beers. We can hardly wait for next year!

Matthew Jarvis lives in Eugene, Ore., which is almost a brewing mecca in itself. He has been brewing since 1998 and has won several awards for his porters and stouts. These days he is exploring the path to the perfect weizen while writing computer software for various clients and the homebrew hobbyist. ([www.BrewDomain.com](http://www.BrewDomain.com))

Rob Hudson lives (for hops) in Eugene, Ore., and has been brewing on and off since 1994. He recently won his first ribbon for an IPA. In his ongoing quest for homebrewing knowledge, Rob created [Tastybrew.com](http://Tastybrew.com), an online homebrewing resource.

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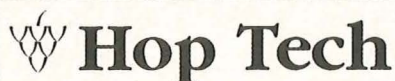
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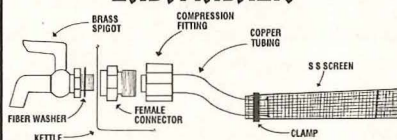
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# Hop Madness Festival

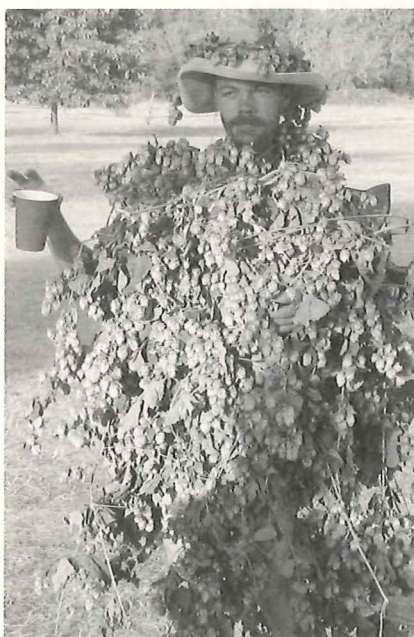
**T**his Labor Day weekend found nearly 50 hop enthusiasts at the first Hop Madness Festival at Willamette Mission State Park near Salem, Ore. Held in Oregon's hop-growing region at the time of the harvest, the event gave homebrewers a chance to learn more about hops while frolicking with fresh vines and cones. Dave Wills of Freshops Inc. sponsored the event with hopes of making it an annual outing.

Since we are both hop heads you can imagine the excitement and astonishment we felt when viewing the hop fields for the first time. We stopped the truck and looked at the fields for several minutes before continuing on to the festival. This only further whetted our appetite for hops!

The weekend offered homebrewers the rare opportunity to brew with freshly picked hops. While it may seem obvious, we debated a long time in trying to decide on a suitable recipe for taking advantage of the freshly picked hops. In the end we came up with a Harvest Ale IPA for 5 gallons loosely based upon the famed Sister Star of the Sun recipe.

The festival activities included hop farm tours, hop wreath making, Hop King and Queen contests, a keg toss, barbecue and of course brewing up some great harvest ales! Since we didn't really know what to expect we quickly unloaded the gear and fired up the strike liquor as soon as possible.

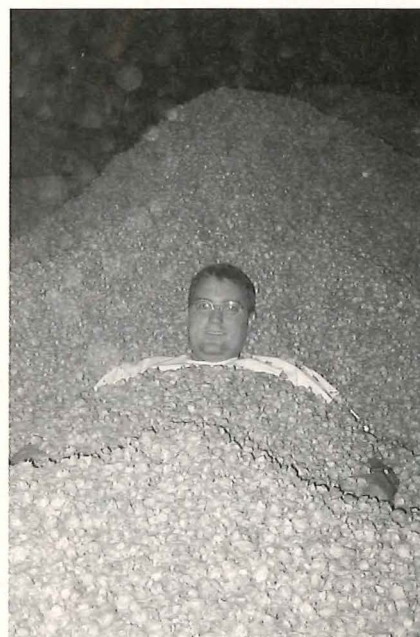
Our recipe called for 13.5 pounds of pale two-row, 0.75 pound of Crystal 80L and 0.5 pounds of wheat malt, all mashed at 151° F (66° C). Fresh hops were plentiful and still on the vine so we took a best guess as to what an appropriate "wet" weight would be and began pulling the cones off the vines. Luckily for us a group from my brewing club, the Cascade Brewers Society (Eugene, Ore.) was attending as part of the club's annual bicycle tour of the area, and they joined in



**Robert Dornbusch, crowned Hop King, proudly displays his ceremonial robe.**

and helped with getting all the hops put together. Rob's mantra for the brew session was, "Don't bother asking—just add more friggin' hops!"

There were also three or four other brewers from the Oregon Brew Crew ([www.oregonbrewcrew.com](http://www.oregonbrewcrew.com)) and StrangeBrew ([members.aol.com/slurpnburpor/](http://members.aol.com/slurpnburpor/)) taking a whack at making some fresh harvest ales. It was a guessing game as to what quantity of hops to use, plus what we originally thought were Perle hops at 10 percent alpha acid turned out to be Willamette hops at around 5 percent alpha acid. We stopped weighing the hops after adding over 30 ounces (850 grams), and heard that one of the other brewers had put in close to 4 pounds (1.8 kilograms)! A couple of lessons learned: just because the hops aren't "wet" doesn't mean they don't soak up a lot of wort; also, putting that many hops in the kettle makes for difficult stirring.



**Rob Hudson steeping in a pile of Willamette hops.**

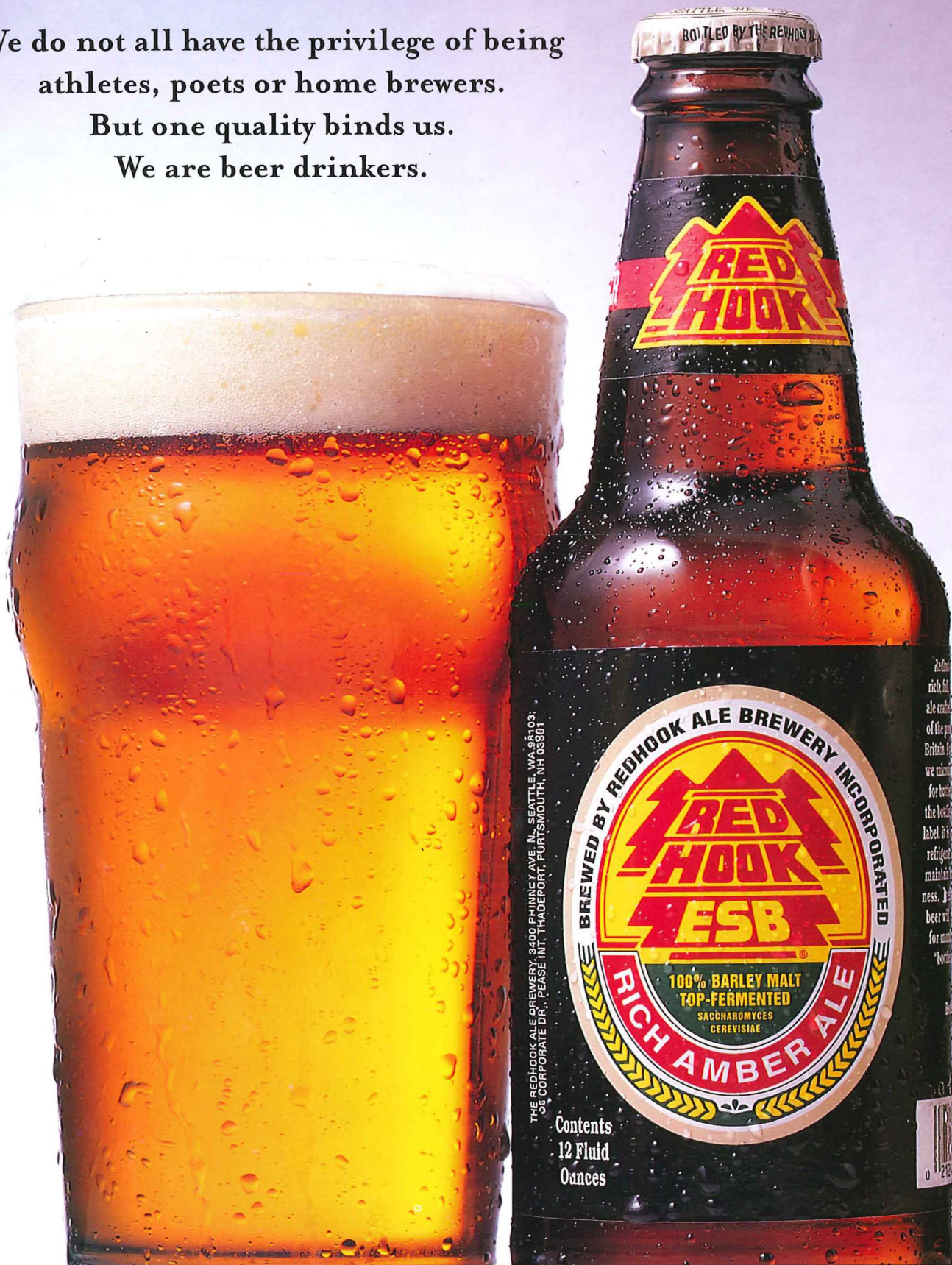
During all of this we could hear the whoops and hollers of people enjoying themselves with the keg toss and Hop King/Queen contests. The smell of barbecue carried through the air and the beer was flowing at several strategically placed kegs.

All of this was fun, but the highlight of the day was the guided tour of the hop farm and processing facility, led by Dave Wills. At the farm's processing facility, we saw how the vines are strung on a conveyor belt so that mechanical pickers can strip off the cones and leaves. The picked cones then pass through fans that separate debris before making their way to the drying room. Here the hops are laid out on a pad approximately 40 feet by 120 feet and dried with hot air from below. The process at this facility (built in the 1950s) takes close to nine hours.

For us, the big event was taking a nose-dive into piles of (continued on page 62)



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