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Published by the American Homebrewers Association, a division of the Brewers Association. The purpose of the Brewers Association is to promote and protect small and independent American brewers, their craft beers, and the community of brewing enthusiasts. The Brewers Association is a not-for-profit trade Association under Section 501(c) (6) of the Internal Revenue Code. Offices are located at 1327 Spruce Street, Boulder, CO 80302 USA. Membership is open to everyone. *Zymurgy* (ISSN 0196-5921, USPS 018-212) is the bi-monthly journal of the American Homebrewers Association and is published six times per year. Periodicals Postage Paid at Boulder, CO and additional mailing offices. Canada Post Agreement Number 41197537. Annual memberships are \$43 U.S., and \$52 International and include a \$35 subscription to *Zymurgy*.

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We all have a favorite drinking vessel in the cupboard. What's yours?

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# Hot Damn! It's Time.

Like many homebrewers, I got my start with Charlie Papazian's *The Complete Joy of Homebrewing*. I bought my copy of the third edition on October 16, 2009, one month after purchasing a homebrew equipment starter package and an English pale ale extract kit on a whim.

In the weeks between getting the gear and buying the book, I attempted to brew a partial-mash Belgian-style dubbel kit from the local homebrew store. I didn't understand that the methods and aims of partial mashing were slightly different from those of steeping specialty grains, and when the original gravity came up several points short, I decided I needed help. Charlie's book, with its fanciful illustrations and playful recipe names, resonated with my personal aesthetic.

I read it cover to cover in just a few days. Then I read it again. It went on at least one camping trip. I can't claim to have combed through every recipe in detail, but at the very least I devoured the entertaining introductions and skimmed the ingredients.

As I gained homebrewing experience, my library expanded to include an unholy number of books about brewing, cellar- ing, classic styles, not-so-classic styles, ingredients, and beer history. But after nearly a decade, I still find myself inspired by Charlie's classic tome, which Michael Jackson called "a lifestyle manual, a philosophical tract, and a work of subversive literature" in the book's preface.

"Inspirational essay" would be an apt addition to Mr. Jackson's list.

## WORDS WITH FRIENDS

I've appreciated the language in *The Complete Joy of Homebrewing* since the first reading. Of course, there's the famous man-

tra to relax and not worry, but subtler gems were what really won me over. Now they have become old friends.

There's the charismatic wooden spoon with which you stir boiling wort. There are strained relationships improved with, of all things, a strainer. And there's the delightful discovery that "Love" and "Sex" have been awarded their own entries in the index. (If you don't read indices, you should start today.)

But my favorite line in the whole book lies in the section for beginners and shows up when it's time to stop waiting and drink your first batch of homebrew:

**HOT DAMN! It's ready.**

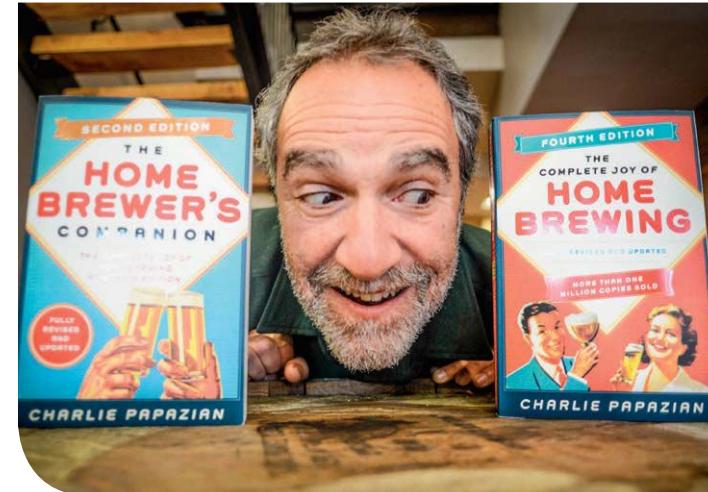
These four words have stuck with me even more than have relaxing and not worrying. Every time I crack open the first bottle of a batch or pour the first pint from a keg, I always think to myself, "Hot damn! It's ready." Even if I discover that the beer is, in fact, *not* ready and could benefit from a little more age, the Frankensteinian sentiment remains the same. This beer I made—it's alive!

I don't always say it out loud, but I say it in my head every time.

## PROFESSIONAL DEVELOPMENT

Almost four years to the day after I purchased *The Complete Joy of Homebrewing*, I met Charlie for the first time at the Saturday afternoon session of the Great American Beer Festival (GABF), where he kindly signed my wort-stained copy. (I also met Stan Hieronymus and Vinnie Cilurzo that day. Be still my beating heart.)

A little more than two years after that memorable GABF, I joined the Brewers



Association staff as Zymurgy editor and had the honor of serving Charlie a beer in my first week on the job. Very occasionally, dreams do come true.

Editing Charlie's text for Zymurgy was simultaneously exciting and terrifying. What would give an amateur home cook the right to even begin dishing out feedback to Jacques Pépin or Massimo Bottura?

I reconciled it by accepting that my job was to help Charlie tell his story without getting in the way of it. It's what editors aim for with all writers, but when that writer is a legendary former editor-in-chief, the self-inflicted pressure is even greater.

If anyone should have a good excuse for missing a deadline, it is Charlie. Yet his columns were always delivered on time if not well in advance. Even when faced with the piles of responsibility that accompany the Craft Brewers Conference, Homebrew Con, and the Great American Beer Festival, I never had to nudge Charlie for his content. If only my own track record could be so exemplary.

## WISHING WELL

On January 23, 2019, Charlie exited the Brewers Association. The physical realities of time zones and almost 120 degrees of longitudinal separation precluded my getting to personally offer a heartfelt *bon voyage* to Charlie on the day of his departure. I could not say it there, so I shall say it here.

Enjoy the next chapter, Charlie. If you have time to update the index for us every now and then, we're still reading.

**HOT DAMN!** You've earned it. And you will be missed.

**Dave Carpenter** is editor-in-chief of Zymurgy.



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**SAHTI:  
A VIKING AGE HOMEBREW**  
Finnish sahti is one of the best surviving examples of what European beer was like before professionally brewed hopped beer became commonplace in the Late Middle Ages.

By Mika Laitinen



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## HOGTOWN HOUSE RULES

The best-of-show (BOS) round is one of the most important parts of a competition, but it isn't always fast. Here's how one homebrew club has made the process more efficient.

By Ron Minkoff

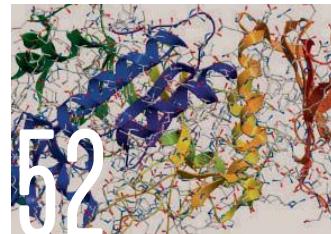


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Fundamentally, home malting is just sprouting seeds and then drying them. But, as with brewing, there's much more to it if you want good results.

By Amahl Turczyn



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## ENZYMURGY

In school, enzymes might have seemed like just another topic you'd never use. But once you start homebrewing, you realize just how important they are.

By John Cuneo and  
Dr. Nicholas Madaffer



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## ZERO TOLERANCE: BREWING TRULY GLUTEN-FREE BEER

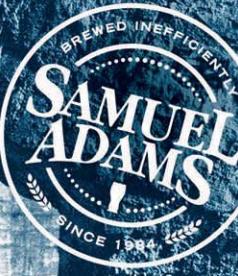
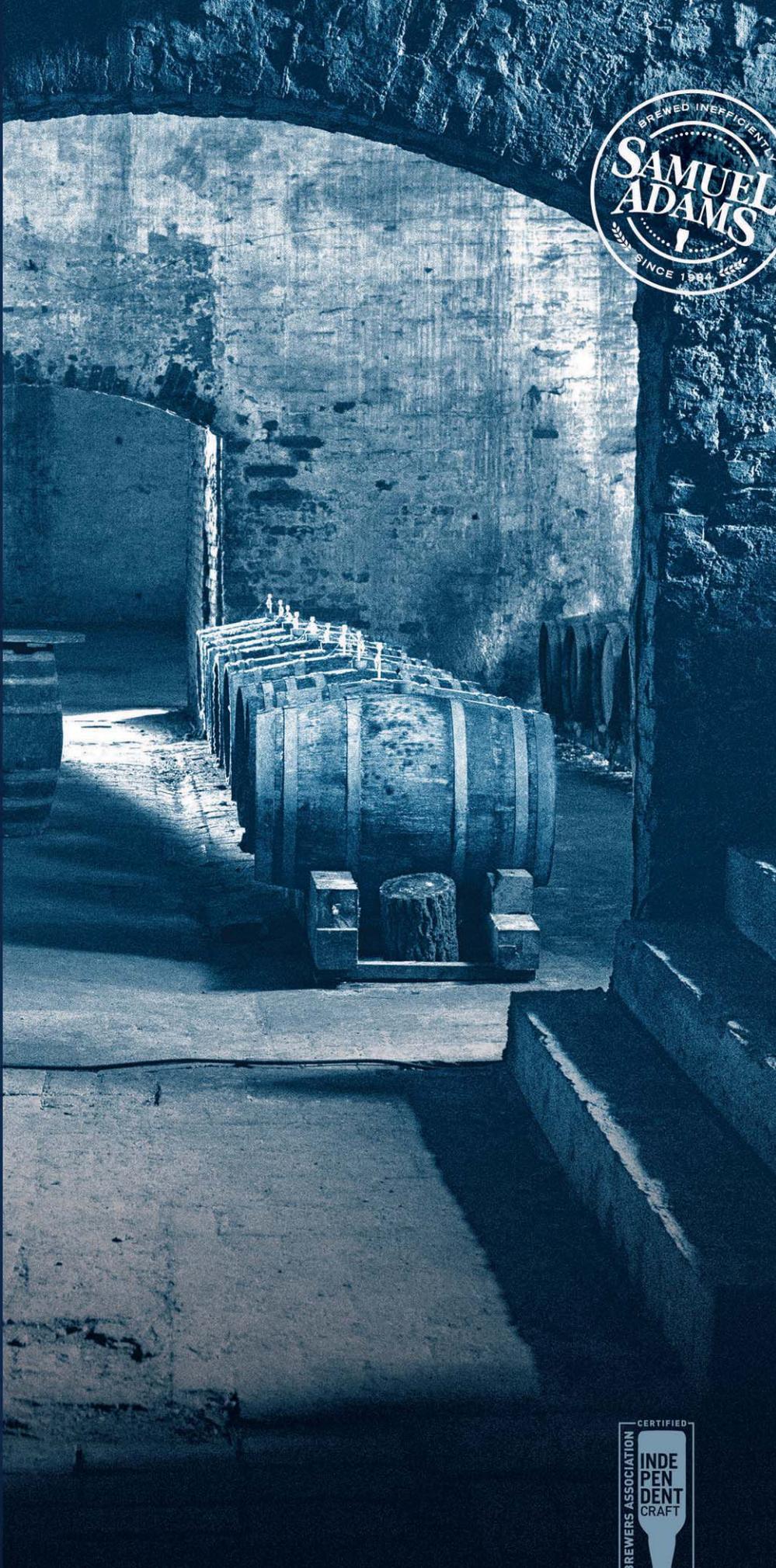
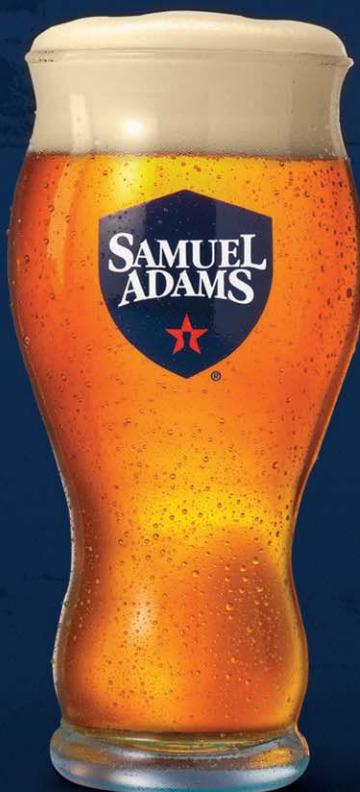
Many brewers view a disease like celiac or non-celiac gluten intolerance as a career ender, but nothing could be further from the truth. See how far gluten-free beer has come.

By Joe Morris

# Slow Lager.

At Samuel Adams, we are inspired by German brewing tradition. Over 600 years ago, beer was aged in caves like the one shown here. In these natural coolers, beer was chilled over time to bring out the best flavor and aroma. While we don't age Boston Lager in caves, we brew and age the beer for over a month to create our most flavorful beer. At Samuel Adams, we believe slow is better.

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© Souders Studios**Vol 42 • No. 2**  
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**ON THE WEB**  
Find these homebrewing recipes  
and more on our website @  
[HomebrewersAssociation.org/  
homebrew-recipes](http://HomebrewersAssociation.org/homebrew-recipes)

**zymurgy**(zī'mərjē) n: the art and science  
of fermentation, as in brewing.

# NOW ON Tap



## Automated Systems

You already know Korea-based LG Electronics for its mobile phones, TVs, and appliances. Now it's getting into the homebrewing business.

LG announced its new **LG HomeBrew** device at the CES trade show in Las Vegas, an annual event that has witnessed the launch of such technological milestones as the VCR (1970), the CD player (1981), Xbox (2001), and 4K ultra-high-definition TV (2015).

LG HomeBrew relies on single-use capsules (think Keurig or Nespresso) that contain malt extract, hop oil, yeast, and flavoring. The user simply pops in a few capsules, fills the water tank, and presses a button. Over the next two weeks, the device handles fermentation while the **user monitors progress on an iPhone or Android device**. When the beer is ready, it's carbonated and served right from the HomeBrew.

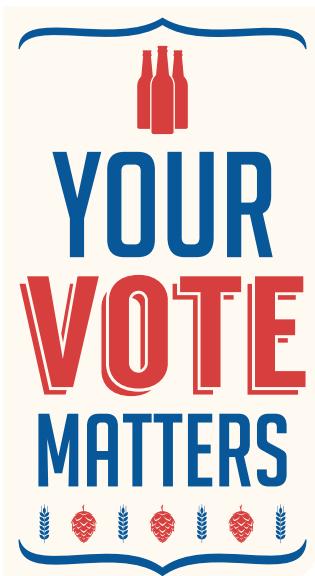
All ingredients are contained in capsules, so there's minimal cleanup, and the machine self-sanitizes using hot water.

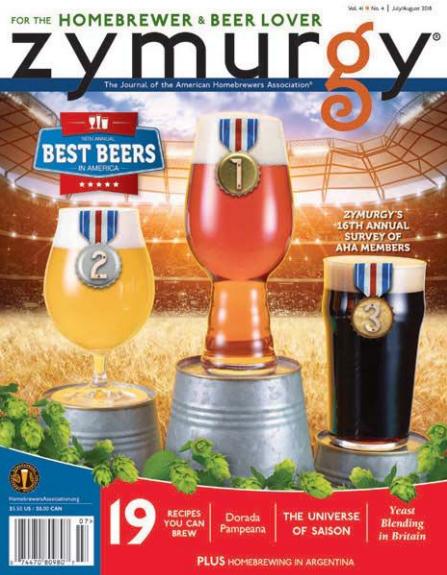
At press time, LG had plans to release capsules for American IPA, American pale ale, Czech Pilsner, English stout, and Belgian-style wit. Each kit yields 5 liters (1.32 gal.). The developers have not indicated whether the HomeBrew will play LG's signature chime when the beer is ready, but we have our fingers crossed.

LG's automated homebrew system is just the latest in a series of such devices that claim to deliver homemade beer without the fuss. For more, check out Efraín Villa's article "Rise of the Machines" in the Jan/Feb 2018 issue of *Zymurgy*.

## Vote for Your AHA Governing Committee

It's time to vote for members of the American Homebrewers Association Governing Committee (AHAGC). The AHAGC guides AHA staff to ensure that member dues support the programs, products, and services that benefit you most. From suggesting *Zymurgy* content to planning Homebrew Con, the Governing Committee provides a crucial link between AHA membership and staff. Log on to [HomebrewersAssociation.org](http://HomebrewersAssociation.org) to read candidate bios and vote. The GC election closes March 31, so vote today and make your voice heard.

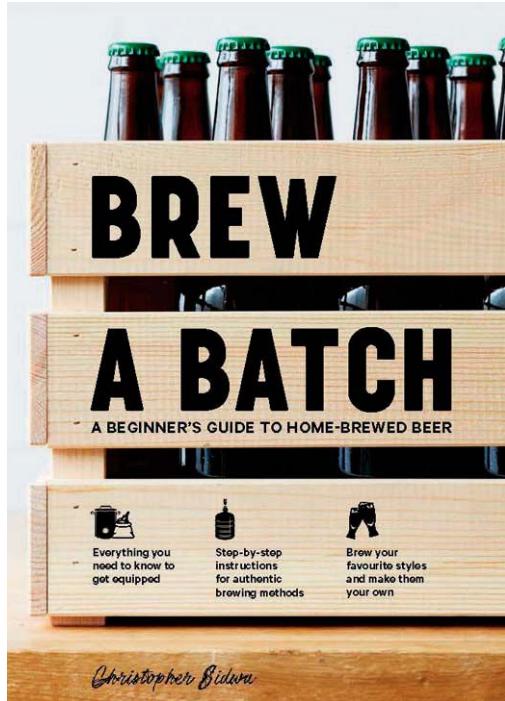




# Vote for Best Beers in America

(AND ENTER TO WIN GOODIES)

It's time for Zymurgy readers to name the best commercial beers in America. Who will be number one in 2019? Sign in to [HomebrewersAssociation.org/zym-best-beers](https://HomebrewersAssociation.org/zym-best-beers) and choose one or more that you think are the best in the land. This annual survey attracts media attention from across the country and helps the AHA promote homebrewing nationwide. All voting members are entered to win one of three swag bags of tasting glasses, Brewers Publications® books, and T-shirts. Voting ends March 25.



## Beer Book

### BREW A BATCH: A BEGINNER'S GUIDE TO HOME-BREWED BEER

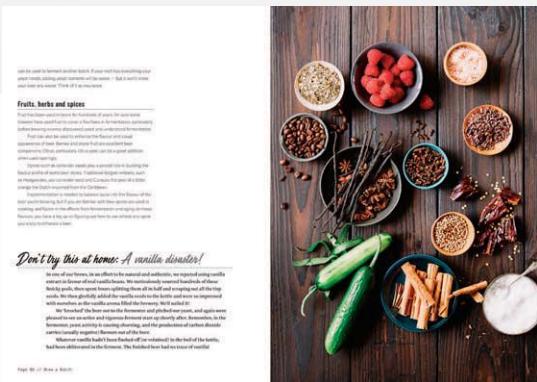
By Christopher Sidwa

From the co-founder of Sydney, Australia's Batch Brewing Co. comes this richly illustrated, no-nonsense book aimed at new homebrewers. In *Brew a Batch*, Christopher Sidwa breaks down the ingredients, equipment, and processes beginning brewers need without complicating matters with lots of technical details they might not yet care about.

International readers will appreciate Sidwa's default use of kilograms, liters, and Celsius, although imperial units are provided in parentheses for those who prefer pounds, gallons, and Fahrenheit.

Zymurgy readers who own a copy of Charlie Papazian's *The Complete Joy of Homebrewing* or John Palmer's *How To Brew* will already have learned most of the material in *Brew a Batch*, but those of us who grab up every brewing book that hits the shelves will buy it anyway (you know who you are, and we are one of you). It would also make a great gift for that friend who has talked about brewing but needs a little push.

For more information, visit [murdochbooks.co.au](http://murdochbooks.co.au).





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## Road Trip!

Heading to Homebrew Con this June in Providence? The following New England road trip is adapted from “Epic Fall Road Trip: New England Breweries Off the Beaten Path” by Matt Osgood, which was published at CraftBeer.com on October 17, 2018.

Of all of the great reasons to drink craft beer—from supporting local, independent breweries to the fact that some of the beer is just so damn good—perhaps the best reason is the experience. Taprooms are becoming unique experiences of their own.

There's something to be said about a road trip, especially in New England, that hits the backroads more than Main Street. Some hidden New England breweries can only be found by exploring this historic region's coastline and winding, foliaged-lined roads. You'll find tiny, scenic small towns and as much diversity in beer styles as there is in geography.

### RHODE ISLAND

**Tilted Barn**, Exeter, R.I. The Ocean State may be the smallest in the country, but Rhode Island has begun to do big things with beer. Tilted Barn in Exeter is as far away from the beach as Rhode Island can get. It's on 30 acres of farmland and, as owner Matt Richardson notes, “a half-mile from any main road, in a century-old barn. It's hard to picture a better place to enjoy a beer.” Every Saturday, there are food trucks to help wash down pints of hazy IPA and double IPA. Richardson is most proud of his “less is more” approach, particularly with regard to the brewery's blonde ale series, which aims to showcase an individual hop in each version.

### MASSACHUSETTS

**Honest Weight**, Orange, Mass. Arguably the prettiest drive through the state is Route 2 through the northern parts of central and western Massachusetts. From Walden Pond in Concord through tiny little hamlets westward, it's a drive that's picture-perfect New England. Just off that ampersand-shaped throughway is Honest Weight on Route 2A, a minuscule brewery in an old mill building on the Millers River. Honest Weight specializes in low-ABV hoppy beers, and barrel-aged farmhouse ales with Brett. Drinkers won't find big, bombastic IPAs here. They'll find a relaxed atmosphere with a local vibe and delicate, balanced, delicious beers.

**Brick & Feather Brewery**, Turners Falls, Mass. Travel a bit more west on Route 2A and you'll come to the tiny village of Turner's Falls (population 4,470), in the town of Montague. Brewing on an equally tiny, 7-barrel system, Brick & Feather was born in 2015. The small-batch brewery fits the small-batch community, and its attention to craftsmanship is evident in every pour. Take the drive to try Letters from Zelda, a ridiculously delicious and delicate-bodied IPA, but don't sleep on Ode to the Afternoon Crew, a 4.9% cream ale.

### ON THE WEB

For more great beer travel articles, check out [CraftBeer.com](http://CraftBeer.com)

**Stone Cow Brewery**, Barre, Mass. “The brewery saved the farm,” says Sean DuBois of Stone Cow Brewery. Currently in its fifth generation of operation, DuBois says they have no intention of stopping milking cows. The beer is just another option at Stone Cow, along with killer food and family-first entertainment. The farm's flagship, Roll in the Hay IPA, is a throwback to the days of an IPA that can be super citrus and floral in the nose and have that bitter backbone. The milk stout, another menu mainstay, is soft and pillowowy with a ton of roasted malt complexity. There are acres of land with grazing cows, a playground, and tons of space in the barn for dancing.

**Notch Brewing**, Salem, Mass. On the banks of Salem Harbor, Notch is a biergarten worth visiting. New England brewer Chris Lohring and his crew run an American session brewery and only make beers under 4.5% ABV. There's zero sacrifice in flavor, though. This low-key place might be the best brewery in the state, and its taproom is always packed. Get a stein of anything from a hazy IPA to a triple-decocted lager. It does not disappoint.



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## NEW HAMPSHIRE

**Moat Mountain Smokehouse & Brewing Company**, North Conway, N.H. Downtown North Conway is a time machine through New England. Nearby Moat Mountain Smoke House & Brewing Company has been canning its beers since before it was cool. And they do a variety of styles from a sweet Czech pilsner to a robust brown ale to, yes, a New England IPA. Don't shy away from the meat either. The bison nachos are incredible.

**Kettlehead Brewing Company**, Tilton, N.H. A half hour north of New Hampshire's capital, Concord, is the beautiful Lakes Region. The area stuns in the summer with its crystal-clear lakes and astounds in the fall with its rich foliage on the drive north up Route 93. Hop off exit 19 to Kettlehead Brewing, a relative newcomer, for both lunch and a couple beers. There's no specializing here. Kettlehead does everything from lagers to IPAs to sour beers.

## MAINE

**Oxbow Brewing Company**, Newcastle, Maine. A true American farmhouse experience comes by traversing the pot-holed dirt roads along the Sheepscot River, past Cowshit Corner, to Oxbow's home in Newcastle, where they're brewing farmhouse ales in an actual farmhouse. Surrounded by 16 acres of hiking trails, this place feels miles away from civilization. Enjoy a mixed-fermentation saison in the refurbished barn or savor a Barrel-Aged Farmhouse Pale Ale.

**Tributary Brewing Company**, Kittery, Maine. There's perhaps no better drive in New England than along coastal Maine, and less than a quarter mile from the Piscataqua River is Tributary Brewing. There's an anachronistic quality to Tributary's beer list, on which will you find stouts, browns, porters, IPA, and Kölsch, all done to stylistic perfection. Mott the Lesser is an imperial stout that gained notoriety when it was called Kate the Great. And it's just as good—if not better—now.

## VERMONT

**The Alchemist**, Stowe, Vt. A stop in Stowe is incomplete without stopping by The Alchemist's mammoth facility, which opened in 2016. The makers of Heady Topper, the original beer you just have to line up for, serves samples of whatever is on tap. But they will send you home with cases of beer including award-winning Beelzebub American stout or the "Is it better than Heady?" single IPA Focal Banger.

**Hill Farmstead**, Greensboro Bend, Vt. The drive through rural Vermont back roads is incentive enough to drive to Hill Farmstead. Come for the views, but stay for the beer. While hops are king in New England right now, Shaun Hill's Farmstead ales are beautifully balanced and well crafted. Try Arthur, Anna, Vera Mae, or... Well, just try them all.

**Lawson's Finest Liquids**, Waitsfield, Vt. For a long time, the only way to get Sean Lawson's Finest Liquids was to wait outside a country store in Vermont on a certain day and hope you were lucky. This changed when Sip of Sunshine and Super Session began getting contract brewed at Two Roads in Connecticut, expanding Lawson's accessibility. But with the fall 2018 opening of a taproom, Lawson's is able to entice drinkers with both old favorites and new beers.

## CONNECTICUT

**Fox Farm Brewery**, Salem, Conn. Located on 30 acres of woodlands, Fox Farm Brewery is housed in a 1960s barn. Owner Zack Adams has garnered acclaim for hop-forward offerings like Burst and Dailily, but he is proud of the farmhouse ales and unfiltered lagers. "Our name is actually a nod to the original Fox family farm, the farmhouse for which is just down the road from the brewery," Adams says. "The nearby open fields are now home to our family's vineyard. We utilize the grapes in a number of our mixed-culture fermented and clean beers."

**Kent Falls Brewing Co.**, Kent, Conn. Kent Falls Brewing's owners live on this working farm, where hops grow and animals roam. In the tasting room, grab one of the juicy IPAs; at a picnic table, enjoy the serenity of the farm with one of the beautifully crafted farmhouse ales, which are delicate, balanced, and refined. Try Senescence, brewed with birch leaves, chardonnay grapes, and Kent Farms' own native yeast.

**OEC Brewing**, Oxford, Conn. OEC Brewing uses Old World techniques of barrel aging and blending to create one-off blends that can be tart, funky, downright sour, and all degrees of complex. OEC also gets a little wacky with "standard" beers, like a pale ale brewed with wild yeasts and an oak-aged lager.

*Matt Osgood is a writer based out of New England, where he lives with his wife, two children, and dog. His work has appeared in The Atlantic, Smithsonian, Vice, and many more. All he wants in life is to drink solely farmhouse ales and eat only lobster. He muses on beer, booze, sports, and parenting.*

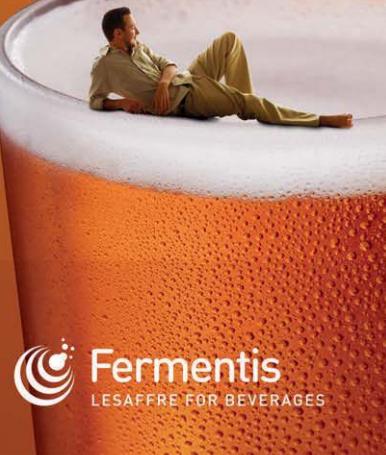
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## Brew-Over

**Nov/Dec 2018, Kudos:** On page 87, the best-of-show winners of the SD Bomberos - 5th Annual Firefighter Homebrew Competition should have been the Brewing Borrachos Brew Club, Ralph Carrasquillo, Victor Carrasquillo, Gabe Padilla, and Jason Justeson.

**Nov/Dec 2018, Kräusening:** On page 38, the second paragraph of the BREW IT AGAIN section should read, "At the 5-gallon (19-L) scale, one way to do this is to brew 4.5 gallons (17 L) of beer. When fermentation starts winding down, brew 5 gallons (18.9 L) of the same beer. When this second beer reaches high kräusen (the peak of fermentation), or slightly before, transfer half a gallon (about 2 liters) of fermenting beer to your initial batch. This will leave you with 4.5 gallons (17 L) of fermenting beer in one vessel and 5 gallons (18.9 L) of kräusened beer in the other. When the fermentation of the second batch is wrapping up, you can brew a third batch, and so on until you want to brew something different."

**Nov/Dec 2018, Kräusening:** On page 38, the second paragraph of the SAVE SOME WORT section should read, "For this to work, you need to be very sanitary in your handling of the kräusen wort and keep an aliquot (separate pitch) of your yeast strain healthy while the main batch ferments. If you store the reserved wort in a sanitized glass bottle, you can put the bottle in a plastic bag and pour crushed ice around it. Store the bag in your refrigerator and the wort will remain somewhere between fridge temperature and 32°F (0°C). The ice is not strictly needed, but I think it helps a little."

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# Farewell, Charlie Papazian



January 23, 2019, was Charlie Papazian's last day as an employee of the Brewers Association (BA). The BA is a not-for-profit organization that evolved from the American Homebrewers Association (now a division of the BA), which Charlie founded with his friend Charlie Matzen 40 years ago. Today, the AHA has 46,000 members, and the Brewers Association Professional Division includes 4,900 member-breweries. The annual Great American Beer Festival, which Charlie also founded, attracts 62,000 attendees and features more than 4,000 different beers from over 800 breweries. Charlie's *The Complete Joy of Homebrewing*, first published in 1984, has introduced hundreds of thousands of readers to the art of homebrewing, yours truly included.

Charlie's mantra of "Relax, don't worry, have a homebrew" has, for the past four decades, helped

remind homebrewers that brewing needn't be hard and enjoying a homebrew is fun.

Charlie's legacy includes helping to bring homebrewing from the fringe of society to a hobby that today boasts more than a million participants who annually produce 1.4 million barrels (1.6 million hectoliters) of homebrew in the USA alone. If it weren't for Charlie's influence, we would not have seen the number of small, independent breweries in the USA meteorically rise from fewer than 50 when the AHA was founded to over 7,000 today.

It's been a great honor for me to work with Charlie over the past 19 years. While I know he's not abandoning the home- and craft-brewing scene, I sure will miss getting homebrewing advice from the legendary Charlie Papazian after work at the Brewers Association bar. Yep, I know, I'm a lucky man.

**Cheers to you, Charlie!**



# YOUR VOTE MATTERS



## AHA GOVERNING COMMITTEE ELECTION

It's time to exercise your patriotic duty as an AHA member and vote in this year's AHA Governing Committee election! The ballot is available at [HomebrewersAssociation.org](http://HomebrewersAssociation.org) now through March 31, 2019.

The Governing Committee is a vital conduit between local homebrewing communities and the AHA. Committee members provide AHA staff with guidance and make decisions about the future of your association.

Fifteen candidates are vying for three open seats. Please review the candidate statements found on [HomebrewersAssociation.org](http://HomebrewersAssociation.org) under the Community section and linked from the Governing Committee pages. Then cast your vote for the candidates you feel will best represent American Homebrewers Association members.

I am deeply grateful to our outgoing Governing Committee members Fred Bonjour and Chris P. Frey for their many years of service to the AHA. Current Governing Committee member Denny Conn is running for reelection.

Fred Bonjour is term limited after having served nine years on the AHA Governing Committee. Fred has been active on several subcommittees, notably the Competition subcommittee and the Content subcommittee.

Fred played an instrumental role in bringing Homebrew Con to Grand Rapids, Mich., in 2014, where he served as one of the co-chairs of the local conference committee.

Chris P. Frey—Crispy to his friends—was first elected to the AHA Governing Committee 15 years ago in 2004. He served as Governing Committee chair from 2008 to 2012 and as one of the two Governing Committee representatives to the Brewers Association's Board of Directors from 2010 through 2018. Crispy has been a speaker at Homebrew Con on several occasions, and he served with Fred as a local committee co-chair for the Grand Rapids conference. Anyone who has attended Homebrew Con will know Crispy from the bright sports coats he dons for the event.

We will miss Fred and Crispy's participation in our monthly Governing Committee calls and in the annual in-person meeting at Homebrew Con, but I am quite certain they will continue to be involved in the homebrewing community and the AHA for years to come.

Governing Committee candidates are willing to devote three years to monthly conference calls, frequent emails, and a half-day, in-person meeting each June; all I'm asking of you is 15 minutes to review the candidate statements and vote. Now go vote! Thank you.

## HOMEBREW CON 2019

Registration for Homebrew Con Providence, happening June 27 to 29 at the Rhode Island Convention Center in Providence, R.I., opens March 12. The 41st annual Homebrew Con marks the first time since 1991 that the conference will take place in New England.

The 2019 Homebrew Con program offers more than 60 different educational sessions to choose from. The speaker list includes some of the most recognized names in homebrewing and craft brewing, so don't miss this opportunity to rub elbows with some beer icons. However, if you can't be there in person, don't despair: we video record all the sessions and post them as AHA members-only content on [HomebrewersAssociation.org](http://HomebrewersAssociation.org) after the conference.

The annual Craft Beer Kickoff Party on Thursday night features local craft breweries and their beers. Friday night is the epic Club Night, when homebrew clubs from around the continent share their best brews from elaborately decorated, club-themed booths. Stop by the Homebrew Expo to peruse the wares of nearly 100 different vendors showcasing



the latest ingredients, equipment, and more. The Expo also includes the Social Club, where homebrew clubs share their creations with attendees.

During Homebrew Con, the nation's top Beer Judge Certification Program judges evaluate the award-winning entries that advanced from the 13 first-round AHA National Homebrew Competition (NHC) judge centers to the final round. We will announce the final-round winners during the NHC awards ceremony on Saturday of the conference, where you'll find out who is the best of the best in homebrewing.

Homebrew Con closes with the aptly named Knockout Party, featuring prize drawings (all registered attendees are automatically entered), hors d'oeuvres, and, of course, beer.

In addition, look for locally organized events for Homebrew Con attendees taking place throughout the week at area breweries, beer bars, and restaurants.

Annually, Homebrew Con is the most fun event any homebrewer could possibly imagine. Don't miss out—space is limited, so be sure to register early! Check out [HomebrewCon.org](http://HomebrewCon.org) for details and I'll see you in Providence.

## RADEGAST CLUB OF THE YEAR AWARD

Homebrew club members, it's time to get your nominations in for the 2019 Radegast Club of the Year Award. The Radegast Club of the Year Award is all about showcasing what makes homebrew clubs awesome, which is why it is also known as the Awesome Club of Awesomeness award.

Nominations for the sixth annual Radegast Club of the Year award must be submitted by March 31. Don't miss the chance to share with the rest of the homebrew community what makes your club awesome. Submit entries via the nomination form in the Community section of HomebrewersAssociation.org. With your nomination, tell us what your club does to promote the hobby, educate your members, support your community, have fun, etc. The form allows uploading documents, PowerPoint presentations, videos, or whatever other materials you have to support your submission.

Entries will be judged by members of the AHA Governing Committee. The winner of the 2019 Radegast Club of the Year Award will be announced June 29 at the AHA Homebrew Con in Providence, R.I.

## HOMEBREW SHOP OF THE YEAR AWARD

For most of us, the homebrew supply shop is the focal point of our local brewing community. Local shops are also where most homebrewers get their starts in the hobby. As such, those shops and their owners play a vital role in keeping homebrewing alive and well. Last year, the AHA introduced the Homebrew Shop of the Year award to recognize the vital contributions these shops make to the community of homebrewers.

Nominations come from you, the AHA members. Does your local shop go above and beyond to support homebrewers and promote homebrewing? Are the staff knowledgeable and helpful? If so, take a few minutes to give that shop some recognition by submitting a nomination for the Homebrew Shop of the Year Award at HomebrewersAssociation.org/ShopAward.

The winner of the 2019 Homebrew Shop of the Year award will be announced at Homebrew Con on June 29.

Until next time, happy homebrewing!

*Gary Glass is director of the American Homebrewers Association.*



George Thorton, owner of The Homebrewer in San Diego, winner of the 2018 Homebrew Shop of the Year Award.

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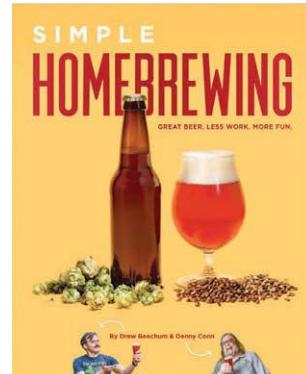
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# Fan Mail

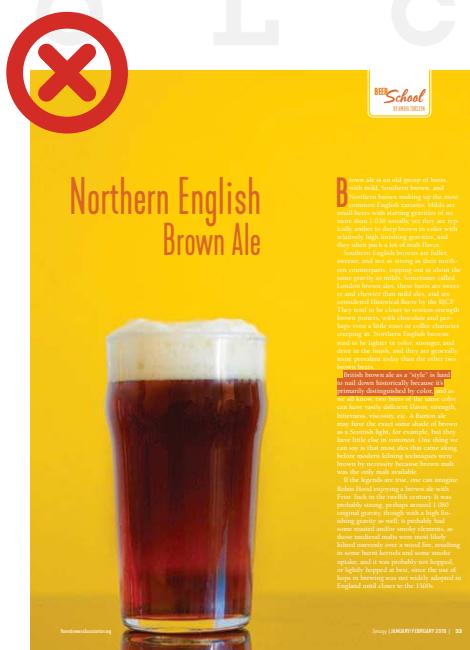
Several readers wrote in to offer candid feedback on the complimentary eye exam we included in the Jan/Feb 2019 issue. Here are a few of our favorite letters.

As a Recognized beer judge in the BJCP program, I appreciate the editorial choice of colors on the Northern English brown ale article in the most recent edition. The aging process affects us all, and it can be challenging to distinguish "straw" from "pale yellow" or "off white" from "cream." By printing the article in white letters on a yellow background, you helped some of us older judges realize that we have to fight hard to keep our eyesight up to deciphering important visual information without relying on contrast.

Dan Ryan  
Kansas City, Mo.

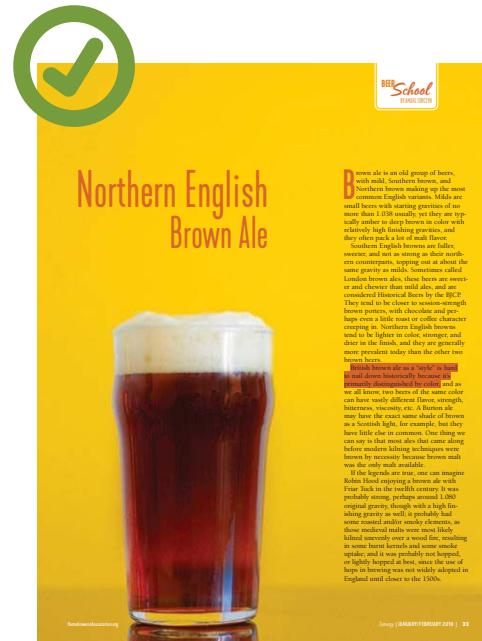
Just received the Jan/Feb 2019 issue, and while I like the redesign over the last few issues, can you help your older readers? The first page of the article regarding Northern English brown ales in this issue is unreadable. White print on a yellow background? How did that get past editors? Too much homebrew?

Joe Dauria  
Braintree, Mass.



I've been reading *Zymurgy* for years and simply love the magazine. The articles are interesting, it's nice to hear about the latest homebrew legislation, and the recipes are great. That said, I've got one beef: even with my "cheater" reading glasses, I've been struggling to decipher several pages because there is very little contrast between the copy and background images or page color. If I recall correctly, more than half of the members of the AHA are in their 40s, and some of us have already been in our 40s, so I'm probably not alone in this struggle. Be nice to your elders and make accessibility as much of a priority as beauty.

Michael Heitt  
Lutherville, Md.



**Zymurgy editor-in-chief Dave Carpenter responds:** We hear you loud and clear, although having just turned 40 ourselves, we don't hear (or see) as well as we once did. "Too much homebrew?" Guilty as charged, but I promise we were all 100-percent sober when we reviewed the proofs.

What looked good on a screen and on matte paper obviously didn't translate well to the glossy page, and for that we apologize. We'll pay extra attention to this in the future and make sure there's enough contrast. →

## YOU'RE GONNA NEED A BIGGER FERRULE

Dear Zymurgy,

I opened the Gadgets issue (Jan/Feb 2019) and found that my "Tri-Clamp Fittings for Kegs" project had made the list! The original project attached 1" ferrules, but when I wanted to add a tri-clamp heating element for an electric boiler, I needed 1.5" ferrules.



As luck would have it, Bobby from BrewHardware.com developed a nifty swaging tool (he calls it a "pull-through flaring tool") specifically for 1.5" ferrules, as well as an assortment of 120- and 240-volt ultra-low watt density heating elements that use a 1.5" tri-clamp attachment. I've used the tool several times now and highly recommend it.

Jim Mayhugh  
Las Vegas, Nev.



## MORE ON FERMENTABILITY

Dear Zymurgy,

The response for mash temperature and fermentability in the Nov/Dec 2018 Ask the AHA column was excellent and educational. It's interesting that you can still get 80 percent apparent attenuation in the low 130°F (mid 50s °C) range.

My empirical experience with the iodine test is that mashing in the low 140s °F (low 60s °C) range, where alpha amylase is less active, does not appear to fully convert polysaccharide starches, but that may also be a function of "reasonable time" (an hour), so a graph showing the full conversion versus temperature might be interesting. Of course, pH and water-to-grist ratio are other factors, but those are generally constant for most of the beers that I brew.

From the graph and table that you published, it's clear that erring on the cooler side is better. A 10°F (5.6°C) decrease from the typical 152°F (66.7°C) recommendation will still work fine, but 10°F (5.6°C) warmer quickly denatures the enzymes: not just beta amylase, but also the proteolytic enzymes that are active in the 110 to 130°F range (43°C). By the way, the new format looks great!

Nelson Crowle,  
Brighton, Colo.

**Zymurgy editor-in-chief Dave Carpenter responds:** We're glad that you found the information helpful. It's possible, even likely, that the data points we printed were obtained under lab conditions, so real-world results

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might differ. Nonetheless, the trend seems pretty clear, and we are keeping our eyes open for additional information on this topic. We'll be sure to share anything compelling that crosses our desks, and Zymurgy readers are, of course, encouraged to let us know what you find!

## KIDDING AROUND

**Dear Zymurgy,**

I held my own learn-to-homebrew day as I was making one of the beers that will be served at my upcoming wedding. Along with my friends who wanted to learn more about the brewing process, there was one very eager guy wanted to help, our friends' 13-month-old son Gavin. He was happy to assist in the brewing process, and the picture speaks a million words of how the day went. I look forward to seeing what Gavin's first brew will be.

Mark Bond  
Austin, Texas



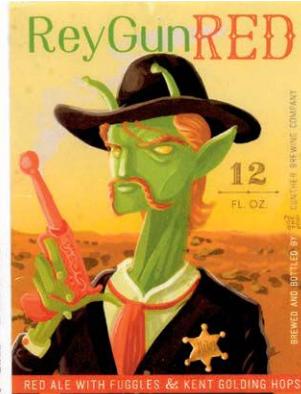
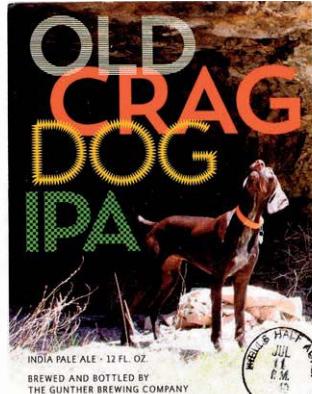
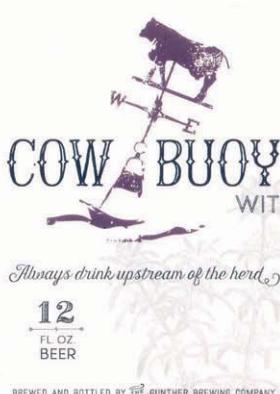
### DEAR ZYMURGY

Send your Dear Zymurgy letters to [zymurgy@brewersassociation.org](mailto:zymurgy@brewersassociation.org). Letters may be edited for length and/or clarity.



A couple of years ago, my wife and I took a trip to Chicago. The hotel where we stayed had fields filled with bright yellow dandelions. Against my wife's wishes, I picked two grocery bags full. On the way home, we also stopped at a local apiary and purchased some delicious wildflower honey. After an hour of picking yellow petals from dandelion stems, three months of fermenting, and 12 months of bottle aging, here it is: our Lion Head Mead. I have been homebrewing for three years and I've been an AHA member for one.

Giovanni Piva, Saint Louis, Mo.



## HOMEBREW LABELS

My daughter Kristen is a PhD ecologist living in Wyoming. She married Wyomingite Rusty last year in our home state of Maryland. My friend John and I brewed and bottled 22 cases of beer for the wedding.

Our labels combine her Maryland heritage with his western roots. Kristen and Rusty's dog Gus loves to rock climb with them. A dog that climbs is known as a crag dog, hence the Old Crag Dog IPA featuring Gus posing at Veedauwoo, Wyo. Since her name is Gunther and his is Reynolds, we came up with ReyGun Red Ale, with the Martian cowboy, courtesy of our graphic designer friend Christine. Finally, we used our wedding icon, the cow buoy (also thanks to Christine), which represents the Chesapeake Bay and Wyoming to name the CowBuoy Wit. I appropriated the saying "Always drink upstream of the herd" from Will Rogers.

Frank Gunther, Hydes, Md.



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Paul Mattos, Campos do Jordão, Brazil



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# Smoked Cherry Wheat Yeast

I am getting ready to make a smoked cherry wheat beer and would like to know whether there is a preference for yeast strains. I have Omega Yeast's American Wheat and Wyeast 1010 American Wheat. This is my first wheat beer recipe, and I could use the help since I am fairly new to the creative process. I decided to make a 1-gallon (3.8-liter) batch to start.

Catherine Johnson  
Pagosa Springs, Colo.

Hi, Catherine, any American wheat yeast should do just fine. Unlike Bavarian wheat and Belgian wit yeasts, American wheat strains won't throw many esters and phenols that might clash with the smoke and the cherry. American wheat yeast will ferment more cleanly. These yeasts could, however, leave a bit of tartness in the finish, so consider working a little (but not a lot of) residual sweetness into the beer so that the smoke and cherry have a little backbone to help prop them up. Let us know how it turns out!



## OVERNIGHT SANITIZER

I usually sanitize everything right before I start brewing. As I get older, this takes longer and longer and makes for a very long brew day. Is it OK to sanitize everything the night before?

Ted Cory

*Hello, Ted, we hear you. Anything that makes brew day easier is a good move in our book if it helps you brew great beer. The good news for those of us looking to break tasks into more manageable chunks is that most sanitizers homebrewers use remain effective for a long time. You could whip up a batch of Star San or Iodophor the night before you brew and let everything soak in it while you sleep. If you keep your sanitizer in a spray bottle, just spray everything thoroughly to ensure that it gets in contact with all surfaces. The trick, then, is to find a sanitary environment in which to store that equipment until you brew.*

*If you happen to have a spare Corny keg, you could fill it with sanitizer and let it soak for a few minutes. Then push out the liquid with a bit of CO<sub>2</sub>, or simply dump the sanitizer into a plastic bucket to use later. Chuck all your sanitized bits and bobs into the keg, seal the lid, and you'll have a sanitary keg full of sanitary equipment waiting for you in the morning.*

Know, however, that long soaks in sanitizer can discolor plastic equipment. Vinyl tubing and other clear plastic parts might take on a cloudy, translucent appearance if you leave them in Star San for an extended period. Soaking any kind of plastic in Iodophor for more than a few minutes will almost certainly give it a rich, saffron hue that you might find unsightly. Such discoloration is only cosmetic, though, and won't affect the performance of the equipment.

Sanitizing doesn't eliminate all microbes—for that you'd need to sterilize, which is beyond our means—so it's probably best to use your sanitized equipment the next day. If you have to postpone brew day for some reason, perform the sanitation ritual again the night before.



# Chimay Dorée Clone

Recipe by Amahl Turczyn with variation by Kurt Elia



**Batch volume:** 5.5 US gal. (20.8 L)

**Original gravity:** 1.040 (10°P)

**Final gravity:** 1.004 (1°P)

**Efficiency:** 75%

**Color:** 3 SRM

**Bitterness:** 20 IBU

**Alcohol:** 4.6% by volume

## MALTS AND SUGARS

6 lb. (2.72 kg) Dingemans Pilsner malt  
12 oz. (340 g) Dingemans 6°L Cara 8 malt

8 oz. (227 g) Belgian wheat malt  
8 oz. (227 g) white sugar @ 10 min

## HOPS

1 oz. (28 g) Saaz, 4% a.a. @ 60 min

0.5 oz. (14 g) Hallertau, 4.8% a.a. @ 30 min

## ADDITIONAL ITEMS

1 oz. (28 g) ground bitter orange peel (10 min)  
0.5 oz. (14 g) ground coriander seed (10 min)

6.5 oz. (184 g) candi sugar to prime (if bottling)  
1 tablet Whirlfloc @ 15 min

## YEAST

White Labs WLP500 Monastery Ale Yeast

## BREWING NOTES

Mash at 147°F (64°C) for 75 minutes. Mash out at 168°F (76°C) for 10 minutes. Sparge, boil 90 minutes, and add hops, sugar, and spices at stated intervals. Chill to 64°F (18°C), oxygenate, and pitch a strong starter of yeast. Ferment at 72°F (22°C) for the first 4 days, then at 66°F (19°C) until fermentation begins to slow; then chill to 50°F (10°C) and cellar for 4 weeks. Rack clear beer onto priming sugar (blending thoroughly), bottle, and condition beer for 8 days at 75°F (24°C). Cellar beer for 4–6 weeks.

## KURT'S VARIATION

Replace 12 oz. (340 g) Dingemans 6°L Cara 8 malt with 10 oz. (283 g) Briess Caramel 10°L malt, replace 8 oz. (227 g) Belgian wheat malt with 8 oz. (227 g) Weyermann wheat malt, and replace 8 oz. (227 g) white sugar with 8 oz. (227 g) Simplicity Candi Syrup plus 6 oz. (170 g) table sugar. Prepare a 750 mL stir-plate starter of White Labs WLP500 Monastery Ale Yeast prior to brew day. Postpone the 30-minute Hallertau hop addition to 15 minutes before the end of the boil.

Conduct a single infusion mash at 149°F (65°C) for 75 minutes at a pH of 5.3, and fly sparge to collect 6.5 gal. (24.6 L) of wort. Add candi syrup and sugar to the hot wort for a pre-boil specific gravity of 1.036 (9°P). Boil 60 minutes, adding hops and spices as indicated (remember to add the Hallertau at 15 min. instead of 30 min.), to yield 5.5 gal. (20.8 L) of 1.041 (10.2°P) wort.

Chill, oxygenate, and pitch at 64°F (17.8°C). Ferment at 71°F (21.7°C) for 2 days and then at 69–71°F (20.6–21.7°C) until fermentation slows. Raise to 72°F (22.2°C) for a couple of days until specific gravity reaches 1.004 (1°P). Rack to secondary and fine with 0.25 oz. (7 g) Polclar mixed with 350 mL (12 fl. oz.) boiled water. Hold at 65°F (18.3°C) for one day, and then slowly lower temperature to 35°F (1.7°C) at a rate of about 4°F (2.2°C) per day.

Rack clear beer to a keg and hold at 35°F (1.7°C) under 15 psi (1,034 mbar) for 9–10 days or until carbonated to 3 vol. (6 g/L) CO<sub>2</sub>. If you can wait, let the beer cold condition for a month in the keg after racking and carbonating. The patient brewer will be richly rewarded with a smooth, bright beer.



### CLONING CHIMAY DORÉE

I really enjoyed Amahl Turczyn's Style Spotlight piece on Patersbier in the Nov/Dec 2015 issue. It brought back fond memories of my own visits to the Trappist monasteries from years gone by and got me in the mood to brew some of that Belgian elixir! Chimay Dorée is one of my favorites, and while it was mentioned in the article, it was sadly not among the recipes included. Any chance Amahl has a clone recipe lying around for that classic beer that he could share?

Many thanks,  
Kurt Elia  
Chapel Hill, N.C.

**Zymurgy associate editor Amahl Turczyn responds:** Really glad you liked the article. The recipe for Chimay Dorée is a pretty well-kept secret, so there just isn't a whole lot of information available about brewing it. However, if I were to try and brew it myself, the accompanying recipe shows what I would do.

If you end up brewing it, please let us know if it turns out like you remember, or if you have any suggestions on how to improve the recipe. We'd love to hear it.

As it happens, Kurt did write back a few months later...

You may recall that you gave me some advice for how to clone Chimay Dorée a few months ago. Well, I finally brewed it! After doing a bit of additional research, I made a couple of tweaks, but for the most part I stayed true to your recipe. I just tried the first glass and, while I don't have a bottle of Dorée handy to compare it to, I must say that it is exactly what I remember that beer tasting like.

Kurt's successful variation is given in the brewing notes for the recipe. Thanks for sharing it with us!



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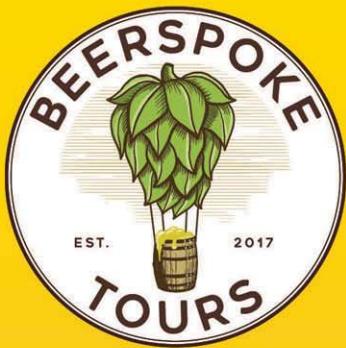


# Metallic Off Flavors

**O**ne common complaint with early homebrewed beers was “Tastes like the bottle cap.” Homebrewers these days tend to be more meticulous about brewing clean beer, but metallic off flavors do still crop up periodically. Iron, copper, and aluminum are the most common culprits. Where do metallic off flavors come from, and how can you keep them out of your homebrew?

## IRON

If you have metallic-tasting beer, iron is the most likely cause. Humans can detect metallic flavors caused by iron in the form of ferrous sulfate at a flavor threshold of 2.7 milligrams per liter, or 2.7 parts per million (ppm). According to Randy Mosher's *Tasting Beer*, iron can't be smelled directly, but it can interact with lipid oxidases, causing them to break down and



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As with diacetyl, sensitivity to metallic flavors varies from person to person.

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Of course, as with diacetyl, sensitivity to metallic flavors varies from person to person; you might recognize that our Commercial Calibration BJCP judge Scott Bickham picks up metallic character in beers far more often than the other judges—I’d guess his sensitivity to the flaw is rather high.

Although iron concentrations over the flavor threshold can taste and smell like blood, coins, or rust, iron in lower concentrations can still be detectable, but perhaps not as recognizable. Affected beer might taste dull, one-sided, and muted as a result. Iron is technically a nutrient, but very little is necessary for yeast health; malt easily supplies enough iron, so you don’t need to intentionally add it to your beer or brewing water.

If iron does show up, the most likely source is your brewing water, either naturally from well water or from rusty pipes or plumbing fixtures; it is easily removed with carbon filtration or, even better,

reverse osmosis. If you still pick up iron flavors after ruling out your water, investigation becomes a little trickier. Bottle caps, like aluminum cans, are lined so that no actual metal comes in contact with the beer, so unless that lining is damaged, you can safely rule out caps.

Ironically—if I can use that term—iron can come from metal equipment that has been scraped, scoured, or vigorously scrubbed; even some high-carbon stainless steels can cause metallic flavors depending upon the grade of steel and whether their surfaces have been compromised or scratched.

Stainless steel should be properly passivated before it comes in contact with beer, particularly low-pH styles like Berliner weisse, gose, and other sours. You should never allow bleach to come in contact with stainless steel. And steel wool for scrubbing your equipment is obviously not a good idea either—use Bar Keeper’s Friend if you need an abrasive, as its oxalic acid tends to passivate steel quickly.

It may be worth taking a careful inventory of all the metal parts of your brew system that come in contact with wort, just to rule out any possible iron or rust sources. That includes your plate chiller if you use one, as well as fermenter fittings, valves, hop spiders, false bottoms or braided steel screens, metal racking canes, counterpressure bottle fillers, etc.

I once owned a stainless-steel kettle from a reputable manufacturer that had rivets protruding from the steel inside the kettle, where the handles were attached. These were obviously not the same grade of steel, as they eventually began to rust right at their base, and this rust was coming into contact with wort as it boiled. Fortunately it was never enough to cause a problem, but it certainly could have—until I went in with a Dremel tool, removed the rust, and then passivated the bare metal with concentrated citric acid.

### COPPER

Copper is a necessary nutrient for yeast, at a minimum concentration of 0.012 ppm, but excessive amounts can cause off flavors. However, the flavor of copper in your brew isn’t necessarily metallic or coppery tasting at all. Instead it tends to render affected beers brittle, astringent, and harsh tasting. At levels high enough to cause this sharpness, it is probably more toxic than beneficial to your yeast.

Excess copper in your water supply can come from your plumbing. Many homes use copper piping, and if your water source drops below a certain pH,

or even if you have a very new home, you may notice blue stains in porcelain sinks and tubs from dissolved copper. It may even be caused by the wrong flux used on your pipes. These are not common situations, but if you do notice the symptoms, copper in your water supply can have health implications beyond bad-tasting beer, so get it checked out by a professional.

Normally, though, trace amounts of copper are good for your beer, and most brewers are more concerned about getting copper *into* their water than out of it. Copper chilling coils are still common, although fresh, shiny, new copper should be boiled in water first before it's dunked into your (acidic) wort. For the same reason, try to resist the urge to scrub an old chiller down to the bare metal. Just rinse it clean—that brownish patina is a good thing and will prevent too much copper from getting into your beer.

The advice to add a couple of pennies to the brew kettle to avoid boilovers is actually pretty sound, but perhaps not for the reason you may think. The coins create nucleation sites for vaporization and ease the kettle wort into boiling rather than have it all gush and foam at once.

Pennies should not contribute any metallic off flavors because today's minted pennies are almost all zinc, with only a very small amount of copper—something like a 97.5-to-2.5-percent (if you'll pardon another pun) ratio. Zinc is a necessary and often sparse nutrient, and will benefit yeast health. Just be sure to wash and then boil the coins first to remove any dirt, oils, or other undesirable residues.

#### ALUMINUM

Aluminum is pretty safe to use, but like steel, it can contribute off flavors if it's scratched or scoured. A common safety procedure would be to boil plain water in your aluminum pots to build up a protective oxide layer; this will prevent metallic flavors. Also, highly caustic cleaners may cause aluminum to leach; anything with a pH higher than 9 should not be used on aluminum.

#### OTHER CAUSES

Improperly stored malt or malt extract can also cause metallic off flavors, primarily from the oxidation of lipids that are then catalyzed by metal ions, so if you've ruled out everything else, try switching out your malt.

Amahl Turczyn is associate editor  
of Zymurgy.



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Sahti master Eila Tuominen  
boils her mash vigorously,  
but there is no wort boil.



*Editor's Note: This article features excerpts from the forthcoming book *Viking Age Brew: The Craft of Brewing Sahti Farmhouse Ale*, by Mika Laitinen. The book will be published on June 4, 2019, by Chicago Review Press.*

# SAHTI

## A Viking Age Homebrew

By Mika Laitinen

**EUROPEAN FARMERS ONCE BREWED BEER FROM THEIR OWN GRAINS. THEY MALTED THEIR OWN GRAINS, FLAVORED THE BREW WITH WHAT GREW NEARBY, AND FERMENTED IT WITH THE FAMILY'S HEIRLOOM YEAST. THESE REGULAR FARMING FOLK PASSED THEIR CRAFT ON BY WORD OF MOUTH.**

In the first millennium, such farmhouse traditions formed the primary way of brewing in Europe. These domestic traditions later came to be superseded, from the 12th century onward, by beer that was produced more professionally and efficiently. By the 20th century, preindustrial-style farmhouse brewing had all but disappeared from Europe. It remained in only a few isolated locations.

A primitive form of farmhouse brewing has been preserved in a few of the northernmost countries in Europe. This has given us

sahti in Finland, *koduõlu* in Estonia, *gotlandsdricke* in Sweden, *maltöl* in Norway, and the *kaimiškas* beers of Lithuania. Sahti is the best known, but these are all part of the same family of ancient farmhouse ales.

These ales are the best surviving examples of what European beer was like before professionally brewed hopped beer became commonplace in the Late Middle Ages. Although farmhouse brewing traditions underwent partial modernization in the 20th century, they still offer a fascinating view of brewing in the Middle Ages and the Viking Age.



The commercial sahti Brewery Olu Bryki Raum giving a historical brewing demonstration.



◀ A map of the Nordic and Baltic countries showing the main areas where farmhouse ale traditions remain alive. In days of yore, sahti was commonly found all over western Finland, but now it is a regional specialty. [Source: Mika Laitinen]

breweries occasionally make sahti, too. Commercial production is regulated by the European Union's "Traditional Speciality Guaranteed" (TSG) specification, which, among other restrictions, forbids the use of modern brewer's yeast and sugar.

Because of its short shelf life and need for cold storage, sahti is seldom exported, and even in Finland, its availability is generally limited to a few beer festivals and select pubs in the bigger cities. For visitors, a Finnish beer festival is usually the best opportunity to try one. However, one should not forget that this tradition is based on domestic brewing, and the most colorful examples are still made by hundreds of homebrewers in the countryside.

### TRADITIONAL SAHTI BREWING

Malted and unmalted grains, juniper branches, hops, and yeast are the core ingredients of sahti. Malted barley is the most common base, but rye, oats, and wheat are also used, both malted and unmalted. Although sahti is often thought of as a rye and juniper beer, there are all-barley versions, too, and some brewers today omit juniper altogether.

Traditional home malting in Finland died out in the 1960s, and most sahti brewers now use commercial malts. Some farmers have revived home malting using their own grains, but, as far as I'm aware, nobody malts in the ancient way with drying barns or a smoke sauna anymore.

Traditionally, juniper branches were used as a filtering aid when the sweet liquid was drawn from the grain solids. This gave a delicate coniferous taste somewhat different from what juniper berries impart. Some brewers further enhanced the flavor by letting juniper

branches stand in hot brewing water, but usually the juniper flavor was kept restrained. If hops were used, the quantities were minimal, and many sahtis were unhopped.

In the old days, farms had their own house yeast strains for baking and brewing, sometimes using one strain for both jobs. Around 1900, commercial baker's yeast started to replace the house strains, and by the 1950s, sahti was fermented solely with commercial baker's yeast. Today's brewers mostly use fresh compressed baker's yeast produced by Suomen Hiiva, which gives a rustic flavor similar to Bavarian weizen.

Much of the character of sahti comes from the traditional process, which evolved from using whatever farm equipment was available and hence relied on wooden vessels. Although many sahti brewers now use stainless steel, brewing practices largely follow the old ways, as if the brewing vessels were made of wood and thermometers had never been invented.

Sahti brewers mash intensively in an ancient fashion that reflects a past of rustic homemade malts: usually, water is poured over the grains in several steps, over five to nine hours, with the temperature rising throughout. The mash is then scooped into a lauter tun called a *kuurna* over fresh juniper branches. This vessel is traditionally made from a hollowed-out log, and even modern kuurnas are usually fabricated in the traditional trough-like shape.

In the beer world, boiling the wort with hops to impart bitterness became common in the Late Middle Ages. The lack of a wort boil is one of the main features connecting sahti with early medieval and Viking Age ale.

The traditional method of sahti fermentation evolved to combat souring bacteria, and it produces non-sour ale even if the

Hannu Sirén from Hartola has been brewing sahti for 40 years, with a kuurna for filtering out grain solids (left), a wooden tub for mashing (middle), and a wood-fired cauldron for hot water (right).



Photos courtesy of Mike Laitinen (unless otherwise noted); Sami Bodkin (brewing demo); Sami Perttilä (Hannu Sirén)

A few breweries in northern Europe have scaled up and commercialized the old domestic farmhouse techniques, but these folk beers are rarely exported, and they can be hard to find even in their homeland. That said, this is only a small obstacle to tasting fresh, malty farmhouse ale unlike any industrial beer sold today. Here, we will unlock the doors to traditional homebrewed sahti.

### A TASTE OF HISTORY

Ancient brewing methods certainly bring a unique taste to these ales, and the first sip of sahti may taste odd. The beers also defy stylistic conventions. In addition to regional differences, there is enormous variation from brewer to brewer, and even sahti from the same brewer can taste different each time, particularly because of differences in the beer's age and storage.

Sahti is a strong ale intended for feasts, weddings, and seasonal celebrations. Both the quality and the quantity of the ale are matters of pride, so sahti is traditionally brewed with a generous amount of malt.

Because of the high quantity of residual malt sugars and proteins, sahti feels nourishing and usually has a thick, milkshake-like mouthfeel. The alcohol content is typically 6 to 9 percent, though this is often deceptively hidden.

The typical sahti is turbid and has virtually no carbonation, and the color ranges from yellow to dark brown. The backbone of the taste is usually formed by a solid, fresh maltiness and substantial sweetness. Typical flavors include dark rye bread, cereals, juniper, and banana and clove spiciness from baker's yeast. Sourness in sahti is considered a flaw: either it's too old or has been improperly stored.

In 2018, Finland had six sahti breweries that scaled up and commercialized traditional techniques. Several Finnish craft



The most traditional way of enjoying sahti is from a wooden haarikka, which is intended to be shared.

yeast or wort has its share of alien bacteria. Typically, sahti is fermented warm from one to three days and then transferred to a cool cellar. Often, a considerable amount of residual sweetness remains, and a slow secondary fermentation keeps the yeast active, protecting the drink from growing stale or sour. These ales are usually served within one to three weeks from the brew day. To prevent souring, fermented sahti needs to be stored cold at all times until serving.

## INGREDIENTS

Brewing sahti is not difficult, but it is a very process-driven beer. Following the old techniques is the key to success. Modern brewing equipment can easily be made to fit the old brewing processes, but I'm afraid the process cannot be replicated with malt extracts.

You don't need the same ingredients the Finnish brewers use. Farmers have brewed with what is readily available, and so can you. Sahti need not taste the same everywhere. Most sahti brewers use Finnish Sahti Malt as their base malt. The Finnish malting company Viking Malt produces this proprietary barley malt blend primarily from Pilsner malt, with smaller amounts of specialty malts. However, any combination of Pilsner, Vienna, or Munich malts should make a good sahti.

Most sahti recipes include 5 to 10 percent Finnish dark rye malt, *kaljamallas*. This unique, lightly roasted malt (90 SRM or 180 EBC) adds color and lends the drink a soft taste of dark rye bread. Although it is not a caramel malt, the best widely available substitute might be caramel rye malt.

Finnish brewers use the juniper species *Juniperus communis* of subspecies *communis*. Other species may look and taste very different, but I see no problem in using them as long as the branches taste good and are edible—bear in mind that some juniper species may be toxic.



# Mika Laitinen's Sahti

This is my standard sahti recipe, adapted for typical homebrewing equipment. I have refined it based on my tastes, various brewing experiments, and conversations with sahti masters. While not a classic family recipe, it's a good example of homebrewed sahti today.

I brew this ale with the same gear I use for modern ales, and I have included options for ingredients easily found outside Finland. I have also streamlined the mashing procedure: with a heated mash tun, the brew day can be over in less than five hours. I haven't included strict fermentation guidelines; this will depend on the yeast you use.

**Batch size:** 5 US gal. [20 L]

**Original gravity:** 1.097 [23°P]

**Final gravity:** 1.034 [8.5°P]

**Bitterness:** 0 IBU

**Color:** 17 SRM (amber brown)

**Alcohol:** 8% by volume

## MALT

14 lb. [7 kg] Pilsner or Vienna malt

4.8 lb. [2.4 kg] Munich malt

1.2 lb. [0.6 kg] Kaljamallas (Finnish dark rye malt) or caramel rye malt

## OTHER INGREDIENTS

0.4 oz. [12 g] juniper branches or juniper berries (optional)

## YEAST

0.8 oz. [25 g] fresh baker's yeast, 0.3 oz. [10 g] dry baker's yeast, or kveik yeast

## BREWING NOTES

Mash the malts at 140°F [60°C] for 45 minutes using 1.1 qt. water per pound of grain [2.3 L/kg]. If using juniper, mix the branches or berries into the mash. Raise the temperature to 158°F [70°C], hold 45 minutes, and then raise to 176°F [80°C] for the final 15 minutes. Recirculate until the wort runs clear. Sparge with 176 to 194°F [80 to 90°C] water to collect 5 gal. [20 L]. If using an immersion chiller, sanitize it in the hot wort. Chill the wort to fermentation temperature. If using baker's yeast, dissolve the fresh yeast in a small amount of cold water, or rehydrate dry yeast in 104°F [40°C] water. Pour wort into the fermenter, add yeast, let ferment, and keep at fermentation temperature until the yeast is finishing its work. Depending on the yeast and temperature, this usually takes 1 to 3 days. When the sahti still tastes sweetish but is no longer cloying, lower the fermentation temperature. If unsure about the timing of this transfer, you can check whether the gravity is in the range 1.034 to 1.038 [8.5 to 9.5°P]. Cold condition the sahti for 7 to 10 days, and then rack to storage containers. The ale is ready immediately after racking. Store cool at all times.

Adding branches to the mash is an easy shortcut for the traditional uses of juniper. For a 5-gallon batch, placing 0.4 ounces of branches (12 g for 20 L) in the mash is a gentle starting point. Juniper berries don't exactly replicate the taste of branches in the mash, but they are an acceptable substitute. Again, 0.4 ounces for 5 gallons (12 g for 20 L) added to the mash or hot wort is a good starting point. Remember that good sahti can be brewed without juniper.

I see no need to use hops in sahti, but subtle hop character does not go against tradition. Contemporary sahti has no real hop flavor or bitterness to speak of.

Brewer's yeast is considered inauthentic for sahti, though it does make for a tasty farmhouse ale. Authentic sahti calls for

baker's yeast or a traditionally maintained farmhouse yeast culture. I have tested several fresh and dried baker's yeasts, and each one has made a decent sahti. Therefore, I suggest brewing your first sahti with a local baker's yeast.

Norwegian farmhouse yeast, *kveik*, is an interesting alternative to baker's yeast. To my mind, a *kveik* without laboratory treatment would count as traditionally maintained sahti yeast since Finnish brewers had similar house yeasts in the past. Even a lab-purified *kveik* captures a great deal of brewing history and will give you a great sahti-like ale. Commercial laboratory isolates of *kveiks* are now available worldwide from homebrew shops.



Sahti master Olavi Viheroja scoops the mash into a *kuurna*. His *kuurna* is made of stainless steel, but the shape and usage follow age-old tradition.

## WORT PRODUCTION

Because sahti wort is not concentrated by boiling, relatively little water is used for mashing and sparging. The mash should be thick, with no more than 1.2 quarts of water per pound of grain (2.5 L/kg).

Most sahti brewers mash for five to nine hours, raising the temperature slowly from hand warm to very hot. This age-old technique works well without a thermometer and with rustic homemade malts. Long mashes and high final temperatures also boost the extraction of malt sugars, which helps to make high-gravity ale from a thick mash. I have noticed, however, that a simpler procedure gets the most out of today's commercial malts. I introduce that procedure in the accompanying recipe for Mika Laitinen's Sahti.

Leaving the wort unboiled is an important part of the tradition, and I recommend sticking to that. Contrary to popular belief, boiling the wort as a precautionary measure for cleanliness isn't necessary. I have fermented unboiled wort with a maximum mash and wort temperature of 176°F (80°C) several times with brewer's yeast, and not once has the ale gone sour. Baker's yeast often contains small amounts of lactic bacteria, and that appears to be the main reason for the souring of sahti. If you must boil, keep it to no more than ten minutes, which will still leave plenty of the proteins typical in sahti.

## FERMENTATION

Whenever your yeast contains bacteria (baker's yeast and some traditional farmhouse cultures) you should follow the old folk wisdom: cool promptly after a short period of warm fermentation, and store in a cool place.

Farmhouse ales were once fermented at hand-warm temperatures, but then the house strains became adapted to such

Brew  
This!



# Olavi Viheroja's Sahti

With two gold medals and several silvers to his name, Olavi Viheroja is the most triumphant sahti brewer in the history of the Finnish National Sahti Competition. His sahti is smooth, rounded, and extremely drinkable. It is sweet but not cloying, intense yet mellow. For many, this reddish-brown malty nectar is the epitome of sahti. Surprisingly, Olavi's sahti skips the juniper. He prefers his brew without the sharper edge they contribute. Some people are disappointed by this, but usually the first sip transforms disappointment into admiration.

To give you a sense of an authentic Finnish farmhouse brewing operation, I present this recipe as I have seen it in action at Olavi's countryside brewhouse in Hämeenkyrö. Olavi does not measure gravity, and he uses a thermometer only to check the pitching temperature. The gravities, alcohol content, and color indicated are from my measurements and calculations.

Olavi brews in an old cowshed with a wood-fired kettle, a purpose-built stainless-steel *kuurna*, and a few old dairy vessels. A stainless steel tub doubles as a mash tun and as the primary fermenter—an old farmhouse brewer's trick. Aluminum milk cans are used to collect and cool the wort, and the sahti both matures and is stored in plastic canisters after primary fermentation. The traditional 8- to 9-hour mashing procedure begins with the mash tun and ends with heating of the mash in the kettle.

**Editor's note:** For a 5.25-gallon (21-liter) batch, simply divide all weights and volumes by 4.

Batch volume: 21 US gal. (84 L)

Bitterness: 0 IBU

Original gravity: 1.092 (22°P)

Color: 15 SRM (deep amber)

Final gravity: 1.034 (8.5°P)

Alcohol: 7.7% by volume

## MALT

75 lb. (37.5 kg) Viking Sahti Malt

4 lb. (2 kg) Kaljamallas (Finnish dark rye malt)

## HOPS

One big handful of homegrown hops

## YEAST

5 oz. (150 g) fresh compressed baker's yeast (Suomen Hiiva brand)

## BREWING NOTES

Pour the malts into a mash tun and add water to the mash in five steps. In each step, pour in 5 gal. (20 L) of water, with increasing temperature:

1. Add hand-warm water and let rest for 1.5 hours.
2. Add warm but not hand-burning water and let rest for 1.5 hours.
3. Add hot but not boiling water, and then let rest for 1.5 hours.
4. Add water that is nearly boiling and let rest for 1.5 hours.
5. Add boiling water and let rest for an hour.

Scoop the mash into a kettle and rinse the mash tun with 2.5 gal. (10 L) of water, pouring this water, too, into the kettle. Heat the mash, stirring continuously to avoid scorching. When the mash begins to rise to the surface, stop heating and let the mash stand covered for an hour. Note: mash temperature at flameout was 176°F (80°C).

Scoop the mash into a *kuurna* and begin lautering, but pour the cloudy first wort back onto the mash. Rinse the kettle with 0.5 gal. (2 L) of water, and pour this water into the *kuurna*. When the wort runs clear, take 2 gal. (8 L) of wort for a yeast starter: cool this wort to 82°F (28°C), and crumble the yeast into it.

Sparge the mash with 2.5 gal. (10 L) of hot water and collect around 21 gal. (84 L) of wort. In practice, the wort volume can be roughly a gallon less or more than this: Olavi decides on the cutoff point by tasting the wort.

Chill the wort in a cold-water bath to 72°F (22°C). When all the wort has been collected, add the yeast starter. Pour a small amount of hot water over the hop cones. Let simmer for a few minutes, and add the hop cones to the wort, discarding the liquid. (Excluding the hoppy liquid may seem counterintuitive, but in the sahti folk tradition, brewers aim to reduce harsh bitterness while keeping the preservative qualities of the hops.)

Cover the fermenter with a cloth and ferment for 2 to 3 days at room temperature, around 60 to 77°F (20 to 25°C). When fermentation starts to calm down, scoop the sahti into plastic canisters, filtering out the hop cones. Place the canisters in a cold location, below 41°F (5°C), and let the sahti cold condition for 2 weeks. Enjoy fresh!

temperatures. For baker's yeast, I recommend 64 to 77°F (18 to 25°C), which is fairly typical among Finnish brewers. With kveik, you can do as the Norwegian farmers do and ferment at 86 to 104°F (30 to 40°C).

Sahti should be moved promptly to a cold storage area when fermentation begins to calm down, usually one to three days after pitching. Many brewers do this before fermentation is complete, and slow secondary fermentation at low temperatures may continue until the ale is ready to serve. This method is effective for protecting against souring and staling, but it takes some practice to master.

You can ferment to completion at warm temperatures, but you should still check the progress often and cellar the ale as soon as you can. Normally, warm fermentation shouldn't take more than four days.

Sahti is not carbonated intentionally, but it may have some fizz from the secondary fermentation.

#### CONDITIONING

To avoid sourness, staling, and gushing of your ale, keep these storage hints in mind.

Since sahti can still ferment at cold temperatures, it is usually stored in containers that allow for the checking and releasing of pressure. Farmhouse brewers typically use plastic canisters and PET bottles. Sahti can be kegged and pushed out with carbon dioxide, but for authentic low carbonation, avoid storing sahti under pressure.

To avoid souring, sahti should be kept cold at all times until serving. Sahti keeps best at 32 to 54°F (0 to 12°C); the colder the better. Above 59°F (15°C), the ale can go sour in as little as half a day. Even if sahti does not sour, it loses its freshness more quickly than modern ales. Brew with a target event in mind.

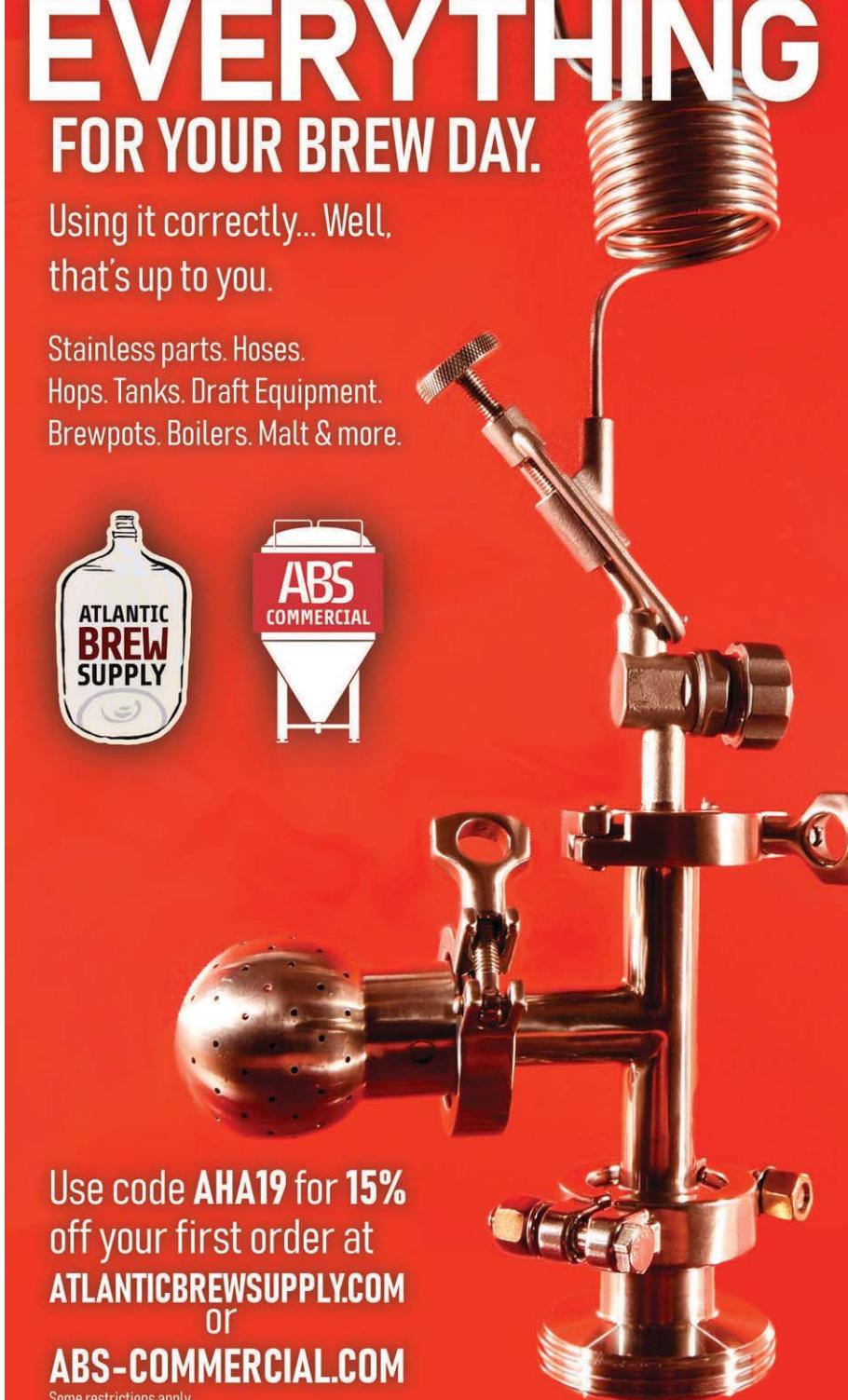
In the accompanying recipes, I use slightly different batch volumes for imperial and metric units to allow for easy scaling. Two pounds for a gallon gives the same weight-to-volume ratio as one kilogram for four liters. That enables a conversion in which a quart corresponds to a liter, two pounds to a kilogram, and one ounce to thirty grams.

*Mika Laitinen is the author of the forthcoming book *Viking Age Brew: The Craft of Brewing Sahti Farmhouse Ale* (to appear June 4, 2019, from Chicago Review Press). He lives, writes, and homebrews in Finland right on the doorstep of the sahti heartland. For more information about Nordic beer traditions, please visit [brewingnordic.com](http://brewingnordic.com).*

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# HOGTOWN HOUSE RULES

How One Homebrew Club  
Names Best-of-Show  
Entries Quickly, Efficiently,  
and Harmoniously

*By Ron Minkoff and Matt Neilson*

A homebrew competition's best-of-show round brings together gold-medal entries from each style category for one final battle royale in the homebrew Thunderdome. Judges separate the wheat from the proverbial chaff to award medals to the top three beers out of potentially hundreds of entries.



## SURVEY SAYS...

We conducted a short survey of BOS round judging practices in September and October 2018 via the BJCP Facebook group<sup>1</sup>, the HomeBrewTalk forum<sup>2</sup>, the AHA forum<sup>3</sup>, and the Homebrewing subreddit.<sup>4</sup> Survey responses were solicited from BJCP members who had either sat as a BOS judge or organized a BOS panel.

We received 80 responses to the survey, with approximately equal representation from each of the six BJCP regions. Almost half the respondents were of Certified rank, a nearly equal number were of higher rank, and the rest included Recognized judges, Certified Cicerones, and non-BJCP judges with professional status. Most respondents had participated in one to five BOS panels, with a decreasing number having participated in more than five. About 11 percent of respondents had served on more than 20 panels!

Nearly all survey respondents were familiar with the bottom-up approach, with the top-down approach being markedly less popular. Several respondents described some form of hybrid approach between the two (e.g., going around the table, with each judge proposing one or two entries to remove and one or two to keep as favorites; or using bottom-up to remove 50 to 60 percent of entries and then going top-down for the remainder) or another customized approach (e.g., random small groups of six entries winnowed down to two or three).

Survey respondents offered many unique suggestions and comments on the BOS panel process. Several respondents described a “musical chairs-style” BOS round in which

judges physically travel around the table to sample entries. One respondent suggested standing judging (no chairs allowed) to hasten the process. Another respondent was “a big fan of the random smaller ‘waves’ of beers coming out to the judges, where tough decisions have to be made in smaller groups.”

One respondent suggested serving lighter styles (e.g. light lagers) later in the process rather than present categories in ascending order, to prevent their sitting out for 20 to 30 minutes and warming up during any ensuing discussion. Another suggested including at least one lower-ranked judge on the panel for the opportunity to learn from more experienced judges.

Some respondents were divided on the length of time required for a BOS panel: several people suggested that the BOS round should not take more than 10 or 15 minutes (since the hard work of judging has been done), while others stressed the importance of discussing every beer and not rushing the process.

Many respondents shared comments along several similar themes: the importance of diversity (e.g., age, experience, gender, amateur vs. professional) for building a well-rounded panel, a willingness for judges to engage in earnest discussion, the ability to compromise, and the impact of overly strong personalities on a panel. One respondent shared the sage advice offered to the 2004 GABF judges by Michael Jackson: “If all you do is eliminate the worst beers, you will end up selecting the least bad beer.”

For judge directors and competition organizers, the best-of-show (BOS) round is one of the most important parts of a competition. Finding qualified judges, assembling and serving entries in a timely manner, and entering results for the awards ceremony all have to happen in short succession. Being selected to judge a BOS round can signify the judge director's acknowledgement of your judging street cred. (Although BOS judges who have submitted entries to the competition might find the honor bittersweet—“Yay, you get to be on the BOS panel!” but “Sorry, no gold medal for you.”)

Two common methods for completing BOS round judging are the bottom-up approach and the top-down approach. In the bottom-up approach, the BOS entry field is winnowed down through repeated rounds in which judges propose entries for elimination. Each judge can argue for retaining an entry, with the potential for discussion at each step. This continues until the field is reduced to a small subset of entries (typically four to eight), at which point discussions can intensify and, eventually, BOS medals are awarded. In the top-down approach, each judge proposes candidates for the medal-winning entries, and then judges discuss their combined set of nominations to decide on the BOS medal awards.

These two methods are often used to award best-of-show medals, but they certainly aren't the only ones.

## AN ALTERNATE APPROACH

There are several potential issues with both the bottom-up and top-down approaches to BOS judging. Completing the BOS round in a timely manner can be difficult with the bottom-up approach, especially in large competitions with 15 or more categories, due to the potential for lengthy discussion at each step. The top-down method can be completed much more quickly through a single, large culling of entries (only proposing the best to move on), but there is no set length of time for subsequent discussion.

With the top-down approach, there can be limited structure for deciding on the final set of entries (How many can be proposed? Are vetoes allowed?), while the bottom-up approach can be overly tedious with the potential for lengthy freeform discussion as entries are removed. Neither offers a set structure for how medal-winning entries are decided. Additionally, a dominant personality on the panel can influence both approaches by either slowing down discussions or exerting personal preference on the outcome (e.g., "I don't like style X, so it's not going to get a medal.").

Since 2010, the Hogtown Brewers, a homebrew club in Gainesville, Fla., and

“  
If all you do is  
eliminate the  
worst beers,  
you will end up  
selecting the  
least bad beer.

— Michael Jackson

2016 AHA Radegast Award recipient, have used an alternative judging format for the BOS round that we call the Hogtown BOS House Rules. This alternative format was initially conceived and prototyped prior to 2010 in South Florida to help keep BOS rounds from taking excessive amounts of time (stories of BOS taking over two hours had become common).

The Hogtown alternative format migrated to our competition, the Hogtown Brew-Off, and has occasionally been used in other competitions in the area. After more than eight years of use, it has consistently reduced the duration of BOS rounds relative to a general bottom-up approach. Typically, judges need only 45 to 60 minutes to complete a five-judge BOS panel—it's never exceeded 75 minutes. The clock starts when the first entry is poured and placed in front of the judges.

Saving time is not the method's only benefit. It tends to be more structured than a typical BOS session, providing a consistent experience and keeping the flow on track. Sequential rounds of voting make the BOS session more democratic and reduce the likelihood that a strong personality will dominate. Every judge gets an equal voice. More importantly, despite the reduced time

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needed, judges aren't rushed and are happy with the consensus achieved to anoint the top three BOS winners.

### HOW IT WORKS

Three features bring Hogtown's BOS process together. First, it concentrates time on entries that have a realistic chance of winning BOS. Hence it is top-oriented and does not use a bottom-up approach. Second, a whiteboard or its equivalent lets all judges easily follow the status of each entry still in the running. (Does this make a noticeable

difference? Yes, it does! Keeping track on a piece of paper that only the head judge can read doesn't cut it.) Finally, a voting/ranking system captures and displays the current consensus among the judges.

We've fawned enough over the benefits; let's describe the details of exactly what the Hogtown BOS process is.

1. The judging panel consists of three to five BJCP judges picked by the judge director, who acts as moderator. The number of judges depends on the number of entries in the BOS round.
2. Stewards pour samples of all BOS entries so that the judges have them in front of them at the same time.
3. Using whatever personal method they prefer, each judge picks their top six entries without ranking them. This takes about 20 minutes.
4. Starting with a blank whiteboard (or equivalent), the moderator writes down entry ID numbers as each judge announces his or her top picks, using tally marks to accumulate votes from multiple judges for the same entry.
5. After all judges have named their top six, it is likely that some entries will have received multiple votes, and a few will have received only one vote. The rest of the entries will have received no votes and are thus out of the running.
6. Judges then discuss the entries that got votes. Each judge is given a chance to offer their rationale and pros and cons for these entries. This exercise should last up to 10 minutes.
7. If, after this discussion, no judges are swayed to favor an entry that only received one vote, that entry is eliminated. Only one other judge need agree to keep a one-vote entry in the running.
8. Now each judge takes a few minutes to pick their top three entries, again unranked, using whatever method they prefer.
9. With a clean slate for the remaining entries, the moderator then polls judges for their top three, repeating the scoring process that occurred during top-six polling.
10. After this polling, the top three are often obvious based on the number of votes received. Discussion can occur if needed to confirm the top three, unranked. With another clean slate, an optional final round of weighted votes can occur to confirm the order. From the three remaining entries, each judge ranks their top three, and weighted points are assigned from each judge: 3 points for first place, 2 for second, and 1 for third.
11. The winners are reported on the formal BOS judge sheet and returned to the registrar.
12. Go have a brew. There's probably time left at the keg competition.

### EXAMPLE BOS PANEL

Enough theory: here's a practical example to illustrate the ideas. Consider a hypothetical BOS session with five judges and 20 gold-medal-winning beers labeled A

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**TABLE 1:** Round 1 of BOS panel. Entries A through O receive at least one vote. Entries P through T received no votes and thus would not have been written on the board. The judge who votes for Entry J convinces one other judge that it should continue to Round 2 despite receiving only one vote in Round 1.

Entry	Votes at start of Round 1	Votes at end of Round 1
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		
T		

through T. Competition entries are normally assigned random numbers, but for the sake of simplicity, we'll use sequential letters to identify entries here.

In Round 1, each of the five judges picks their top six entries for a total of 30 votes. Table 1 shows that 15 entries receive at least one vote in the first round. (Entries P, Q, R, S, and T received no votes and would never have been written down; they are only listed here for clarity.) Those receiving only one vote are eliminated, except for Entry J: in this hypothetical scenario, the judge who votes for Entry J manages to convince at least one more judge that it should remain in contention. The other single-vote entries get no support and are eliminated along with the entries that received no votes. Entries A, B, C, E, F, I, J, K, and M survive Round 1 and are promoted to Round 2.

In Round 2, the five judges pick their top three entries for a total of 15 votes as illustrated in Table 2. Here, entries J, K, and M receive no votes and are thus eliminated.

**TABLE 2:** Round 2 of example BOS panel. Entries J, K, and M receive no votes and are automatically eliminated, and judges agree that entries A, B, and E should also be eliminated.

Entry	Votes at start of Round 2	Votes at end of Round 2
A		
B		
C		
E		
F		
I		
J		
K		
M		

After discussing these results, judges reach consensus that entries A, B, and E should also be eliminated. Entries C, F, and I go on to the Final Round.

In the Final Round, judges rank the remaining three entries by awarding 3 points, 2 points, and 1 point for their first, second, and third choices, respectively. Points are tallied, and the entries are awarded first, second, and third place. The results of that poll are shown in Table 3 along with the BOS results.

It doesn't take long to get used to the process. Its structure helps move things along and encourages harmonious consensus among the judges. Judge directors like it because of the time efficiency, especially if the competition is running late.

That said, this alternative format is not universally adored. Over the years, we have had a few high-level BJCP judges give us feedback that they prefer the bottom-up approach. To their credit, they participated in our Hogtown BOS session using this format and gave it a fair chance. Although they were perfectly content with the top three finalists, their preference was to talk about each entry (even the bottom ones) because doing so has value and promotes a complete discussion. Fair enough.

Whether you're a fan of bottom-up, top-down, musical chairs, or standing waves

**TABLE 3[A]:** Judge roll call in final round of BOS panel. The final three beers are ranked using a points system and assigned first, second, and third place according to the number of points received.

BOS Judge	First choice (3 points)	Second choice (2 points)	Third choice (1 point)
Judge 1	F	C	I
Judge 2	F	C	I
Judge 3	F	I	C
Judge 4	C	F	I
Judge 5	C	F	I

**TABLE 3[B]:** Final round points for BOS panel.

Entry	Points Awarded	Result
C		2nd place
F		1st place
I		3rd place

of beer, or you're piqued by our Hogtown BOS House Rules, we hope we've given you a little push to elevate your own local best-of-show to make it fair, efficient, fun, and, of course, effective at picking the truly worthy top three. After all, the best of the best deserve nothing less!

## RESOURCES

1. [facebook.com/groups/BeerJudgeCertificationProgram](https://facebook.com/groups/BeerJudgeCertificationProgram)
2. [homebrewtalk.com/forum](https://homebrewtalk.com/forum)
3. [homebrewersassociation.org/forum](https://homebrewersassociation.org/forum)
4. [reddit.com/r/homebrewing](https://reddit.com/r/homebrewing)

*Ron Minkoff has been brewing in the comfort of his driveway since 2003. He is a past president of the Hogtown Brewers and a BJCP certified judge. He has co-hosted Grow Radio's Homebrew Talk podcast ([homebrewjockey.com](http://homebrewjockey.com)) since 2010, where, along with co-host partner John, they spread the homebrew gospel one carboy at a time.*

*Matt Neilson began his homebrewing journey back in 2004 when a roommate gave him a dogeared copy of The New Complete Joy of Homebrewing as he was moving. He previously served as the secretary of the Hogtown Brewers, is a BJCP National judge, and the current judge director for the Hogtown Brew-Off.*



**“Sprouting can take anywhere from four to six days”**



# A HOMEBREWER'S GUIDE TO MALTING WHEAT

*By Amahl Turczyn*

**H**ome malting grain for brewing is easy to do but difficult to master. Fundamentally, it's just sprouting seeds and then drying them. But, as with brewing, there's much more to it if you want good results.

Your first decision as a home maltster is choosing what kind of grain to malt. Barley is, of course, the logical first choice for home-brewers, but it may not be the best choice if you are trying your hand at malting for the first time. The most readily available raw, unmalted barley is probably going to be animal feed-grade rather than malting quality. It will be inexpensive, but barley intended for livestock may not be particularly clean, may contain pesticides or herbicides, or may have spent enough time in a silo that the viability of the grain (proportion of seeds that will sprout) could be very low. Most cattle farmers don't care much about such issues, but brewers usually do.

## **WHEAT VS. BARLEY**

If you are lucky enough to live in a barley-growing area, you may be able to buy high-quality malting barley at a low price, but ordering a sack of the stuff online may not be much cheaper than buying a sack of barley that's already been malted. Another complication with barley is that it has a husk. This is good news for brewers seeking smooth lautering, but for beginning maltsters, a husk makes it difficult to gauge when the sprouting grain has reached full modification and is ready to be dried and kilned.

This is because the acrospire—the shoot that first emerges from the kernel and eventually becomes the barley plant—grows beneath that husk. This acrospire needs to grow to the same length as the kernel, at which point the grain has reached full modification. With barley, you literally have to peel off the grain husk to monitor progress.

Barley malt also needs to be heated or “kilned” after it is dried to develop malt flavors. The amount of heat and the duration of kilning determine whether the malt will be pale and high in diastatic power or darker with progressively less enzyme content (think Vienna malt, then light Munich, then dark Munich). You can certainly do all of this at home once you get the hang of it, but when starting out, malting wheat instead of barley makes the whole process much simpler and easier. There are several reasons for this.

Wheat doesn’t have a husk. You can easily monitor the length of the acrospire and halt germination when most of the wheat grains have reached this point. High-quality raw wheat is also fairly easy to obtain because the baking industry uses large amounts of it. Raw wheat can be found by the sack online or even in bulk bins at your local natural foods store, sometimes under the name of “wheat berries.” Because it’s meant for human consumption, it’s usually clean and unbroken, and you can even find organic (theoretically pesticide- and herbicide-free) wheat at reasonable prices. I use hard red organic wheat from Pleasant Hill Grain in Nebraska.

Wheat also doesn’t need to be kilned to develop flavor, and it can be air-dried with as simple a setup as a fan and a screen. Air-dried wheat malt is kind of an ancient brewing tradition; early German brewers called it *Luftmalz* and, according to Fal Allen in *Gose: Brewing a Classic German Beer for the Modern Era*, it formed the basis for that ancient beer style.

Something similar was also used for grisette, according to Dave Janssen in his article “Grisette: A Lost Beer of Wallonian Ancestry” in the May/June 2018 issue of *Zymurgy*. In that article, he discusses chit malt, which was basically undermodified wheat malt. It was given that name because germination was halted just as the “chits,” or acrospires, first emerged from the wheat kernels. The article includes some great recipes, but sadly, the text laments, chit malt is unavailable today. Well, with a little effort, chit malt is easy to create at home, making that spot-on historical grisette you’ve always wanted to brew, or a *Luftmalz*-based gose for that matter, well within your grasp.



## MALTING EQUIPMENT

Equipment for home malting can be as simple as a bucket, a sieve, a couple of wide, shallow pans for sprouting, a spray bottle to wet the sprouting grain, a couple of large sheets of paper to cover the sprouting pans, and the aforementioned screen-and-fan rig for air drying. Cookie sheets and a large convection oven can also be used for drying.

You’ll also want a cool basement or the equivalent for sprouting, around 50°F (10°C) if possible, though this isn’t absolutely necessary. The cool temperature slows germination and helps the grain sprout uniformly, but the primary advantage is that cold temperatures retard mold growth, which can be a real problem any time you have piles of wet starch lying around. Sprouting grain in the heat of summer, especially in humid climates, can therefore be risky.

Turning the grain regularly helps with this, and spraying the top layer before you turn it helps keep moisture levels uniform, which in turn keeps sprouting rates consistent. Professional maltsters use a host of techniques—some ancient, some modern, some brilliantly innovative and unique—to turn sprouting grain on a commercial scale.

Floor malting is one such ancient method. It requires a lot of clean floor space and some poor sap with a shovel to walk from one end of the room to the other, scooping up sprouting wheat and turning it over as they go. With floor malting, you can’t pack the wet grain too deep; this again leads to sprouting rate inconsistency, as the grain on the bottom

**“Some modern maltsters use a variation of floor malting but let machines do the heavy lifting. Others use gigantic rotating drums to both soak and sprout the grain.”**



is wetter and warmer than that on the top layer, so it always sprouts faster. Turning also helps keep all the little rootlets and acrospires from interlocking into one shaggy mass.

Some modern maltsters use a variation of floor malting but let machines do the heavy lifting. Others use gigantic rotating drums to both soak and sprout the grain. The rotation keeps grains separate and sprouting uniform. Root Shoot Malting in Loveland, Colo., has one of these systems, manufactured by Kaspar Schulz in Bamberg, Germany. And then there are the innovators, like the folks at Mecca Grade Estate Malt in Madras, Ore. They designed self-contained mechanical floor “uni-malters” that allow a shallow bed of wet grain to move along conveyor belts as it is continuously turned, all in an enclosed temperature- and humidity-controlled environment.

For home maltsters, equipment can remain simple, or it can be as elaborate and expensive as you want to make it, depending upon how much malt you want to make per batch. Sprouting with regular turning and spraying in a cool, dark area is easy enough to accomplish by hand. But one highly recommended device for processing more than a few pounds at a time is a food dehydrator.

The dehydrator I use has screened trays and an adjustable thermostat, so you can set the temperature and walk away while a fan circulates air warmed by a heating element. It does a great job and can kiln a good 10 pounds (4.5 kg) of wheat malt at a time (if you invest in enough trays), but it still takes a while. Filling it completely and using every tray I had, rotating trays every six hours or so, took the wet malt to an acceptable dryness in about 14 hours.

What's acceptable dryness? Well, if you've ever chewed on a kernel of wheat malt, you'll know that it's crunchy, sweet, and somewhat crumbly, or “friable.” You're looking for that same texture in your own malt; any chewiness means it needs more drying time. If your malt is “steely” and hard as opposed to crumbly, you haven't allowed sufficient modification. This is undermodified malt: you can still brew with it, but you may want to restructure your mash to include some low-temperature rests, starting with a protein rest. This gives the reduced enzyme content time to work on unconverted starches. Such is the case with chit malt, so grisette brewers will have to work longer hours on brew day to give their mashes time to deal with more starch and fewer enzymes.



## STEEPING AND RESTING

**F**irst, you want to hydrate the dry, raw wheat. This is easy enough to do with a clean bucket. Measure out the grain, and then fill the bucket with cold tap water so that it covers the grain by a few inches. Reach to the bottom and stir to make sure there are no trapped air bubbles in the grain bed. If any grain floats to the top, remove it with a sieve and discard it. Most raw wheat intended for bakery mills will be fairly clean, but if the water is cloudy and you notice any floating debris, don't worry; you'll change the water at regular intervals. Allow the grain to soak for eight hours (no longer) at room to cellar temperatures.

At the end of this first soak, pour the grain into a large colander, discarding the water. Cover the wet grain and allow it to rest in the colander for another eight hours before returning it to the bucket for its next soak. The rest between soaks gives the grain time to drain and breathe; left in water, it would not be able to respire, which would prevent germination. Even while draining, grain continues to absorb water.

You may have to repeat this process once more depending on grain freshness and temperature, but eventually you will notice sprouts emerging. This is now “chit malt,” and if your malt is destined for grisette or saison, you can skip right to the drying and kilning. If you're after fully modified wheat malt, though, you'll now need to sprout the grain in shallow pans.

## SPROUTING

**S**prouting can take anywhere from four to six days, and it's the most labor-intensive stage because you have to visit your grain every six to eight hours to spray it down and turn it. Cover the pans loosely with newspaper or something that will permit a little air access. Keep the sprouting pans in a cool, 50 to 55°F (10 to 13°C), dark room if possible. The rootlets and acrospires will continue to grow during this time.

You'll notice the tops of the grain beds drying out a bit between turnings, so spray them with water before turning. Make sure water doesn't pool at the bottom; you want the grain moist, not sitting in water. You'll notice an odd aroma of green grass and maybe cucumbers—this is good. Any garbage or rotting plant odors probably means mold, and if you get that you may have to dump the batch.

Inspect a few grains every day to monitor degree of modification. When 90 percent of the wheat grains have acrospires as long as the kernels themselves, you've reached full modification. The starches should be soft and mealy at this point, with no hard “steely” tip to the kernel. Now you can move on to drying.

Brew  
This!



# CANE TOAD WEISSE

## AUSTRALIAN-INSPIRED BAVARIAN-STYLE WHEAT ALE

Recipe by Amahl Turczyn

This beer was initially conceived as an attempt at one of my first and favorite craft-style ales from way back in the 1980s: Redback from Matilda Bay Brewing in Australia. I have fond memories of quaffing bottles of Redback during my undergraduate years at Cal Poly, San Luis Obispo. That beer did not contain sugar but was instead a down-under version of Bavarian wheat ale. My recipe is somewhat drier due to the cane sugar, but with high carbonation, low hopping, and Bavarian wheat yeast to add subtle hints of clove and banana, it is exceptionally refreshing.

Batch volume:	5.5 US gallons (20.8 L)
Original gravity:	1.050 (12.5°P)
Final gravity:	1.007 (1.8°P)
Bitterness:	13 IBU
Color:	3 SRM
Alcohol:	5.7% by volume
Efficiency:	75%
Boil time:	60 minutes

### MALTS

4.5 lb. (2.04 kg) home-malted wheat  
4.5 lb. (2.04 kg) Briess two-row pale malt  
12 oz. (340g) raw organic cane sugar (optional)

### HOPS

2 oz. (57 g) homegrown Sterling, 2.3% a.a. @60 min

### YEAST

White Labs WLP380 Hefeweizen IV Ale Yeast (2 L starter)

### WATER

Soft: use 1 g/gal. CaCl<sub>2</sub> added to reverse osmosis water

### OTHER INGREDIENTS

6.5 oz. (177 g) dextrose to prime to 3.25 vol. (6.5 g/L) CO<sub>2</sub>

### BREWING NOTES

Adjust your mill for the average kernel size of your home-malted wheat. My wheat kernels were quite a bit smaller than those of commercial malt, and my first brew with home-malted wheat got too coarse a crush—I got a great sparge but a lousy yield. With subsequent batches, not only did my level of modification improve, but double milling the wheat malt on the finest mill setting

gave me much better results without any need for rice hulls.

Mash grains for 20 minutes at 125°F (52°C). Raise to 140°F (60°C) and hold 30 minutes. Raise to 152°F (67°C) and hold 40 minutes. It's probably a good idea to do a starch test to ensure conversion. When it passes, mash out at 168°F (76°C). Fly sparge with 168°F (76°C) water. Boil 60 minutes, adding homegrown hops one hour before flameout. Be sure to take an initial gravity reading.

You may not need to add sugar, but if your gravity is running low, add cane sugar to the boil as needed to compensate. I got a pre-boil gravity of 1.040 (10°P) and added 12 oz. (340 g) of cane sugar to bring the gravity up to 1.044 (11°P), which gave an original gravity of 1.050 (12°P) after boil losses. Keep in mind that my finishing gravity of 1.007 (1.75°P) is based on using the sugar addition; without sugar, expect an FG closer to 1.010 (2.5°P).

Jar up priming gyle or speise 5 minutes before the end of the boil (if using). Chill wort to 64°F (18°C) and pitch a strong starter. Ferment for three days at 64°F (18°C) or until high kräusen, then allow the beer to free rise to 68°F (20°C) and hold this temperature until fermentation is complete. Prime with gyle and bottle in sturdy glass bottles. Keep these at 70°F (21°C) for a week or until they begin to clear. Store at cellar temperatures for two weeks.

### EXTRACT VERSION

Not recommended. You will likely need the diastatic power of the full amount of domestic two-row for complete conversion.



### DRYING

The screen-and-fan setup works great if you live somewhere with low humidity; putting your air-drying setup in direct sunlight also helps. Make sure the layer of wet grain is uniform and fairly thin, and occasionally turn the grain to ensure even drying.

If you have access to a dehydrator with a thermostat, set the temperature to the correct range for nuts and seeds, around 100°F (38°C). The green malt will hold together nicely on the trays with all its interlinked rootlets. As it dries though, these rootless slough off, so you may want to cut circles of aluminum screening to fit each tray to prevent individual kernels from falling through.

With this setup, instead of turning the grain in each tray, you can simply swap the trays around to ensure even drying. My dehydrator has the fan and heating element on the top, so upper trays tend to dry faster than the bottom ones.

Alternatively, if you have an oven that you can set as cool as 100°F (38°C), you might try loading the grain onto cookie sheets and drying it that way. A warmer temperature will also work, but to retain maximum enzyme potential in your malt, try not to exceed 150°F (66°C) at any time during kilning; lower is better. You may have to prop the door open slightly.

Turn the grain in the cookie sheets often for even drying. The grain is done when the grains are crisp and their starches are brittle, which corresponds to a moisture content of about 7 to 10 percent. You can now safely store your malt without fear of mold or spoilage. Note that if you air dry your malt in a humid climate, it can be hard to reach this level of dryness. If your malt is still a bit chewy after several days, you might consider finishing it on cookie sheets in a low-temperature oven.



## DE-CULMING

**N**ow it's time to move to the final phase, which is removing all those little dried-up rootlets and acrospires, called "culms," from the malt. Why? Three reasons: (1) left on, they will increase protein and haze in your beer; (2) they can cause bitter flavors; and (3) they can stick up your mash with a greyish muck that will make lautering difficult. But removing the culms isn't difficult.

A side benefit of reaching the proper moisture level when drying the malt is that these threadlike fibers become brittle enough to break off with little effort on your part. Just agitating the malt with your hands should knock off most of them (some folks even put the malt in a pillowcase and run it through a no-heat clothes dryer cycle). But then the problem becomes how to separate the chaff-like culms from the malt.

Pouring the grain from one bucket to another in a thin stream in front of a fan will blow away much of this material—and make a big mess. I put half a pound (227 g) or so in a fine-meshed steel sieve and scrape it around with my fingers over the sink. This is pretty effective, and you'll soon have a pile of the fine brownish stuff to show for your efforts, but it's tedious, time-consuming work. You could probably devise a screened drum on a spindle, along the lines of what backyard coffee roasters use, for a large-scale home malting operation.



## STORAGE

**Y**ou probably won't need a silo to store the quantities you malt at home; plastic zip storage bags stored in a cool, dry location should be sufficient. Some sources claim malt should be rested for a period before use in brewing, but that pertains more to crystal and roasted specialty malts than to base wheat malt. Malting wheat is satisfyingly simple, and hopefully your first batch is successful enough to encourage you to tackle more challenging malting projects, like barley and those specialty malts just mentioned.

## BREWING WITH YOUR MALT

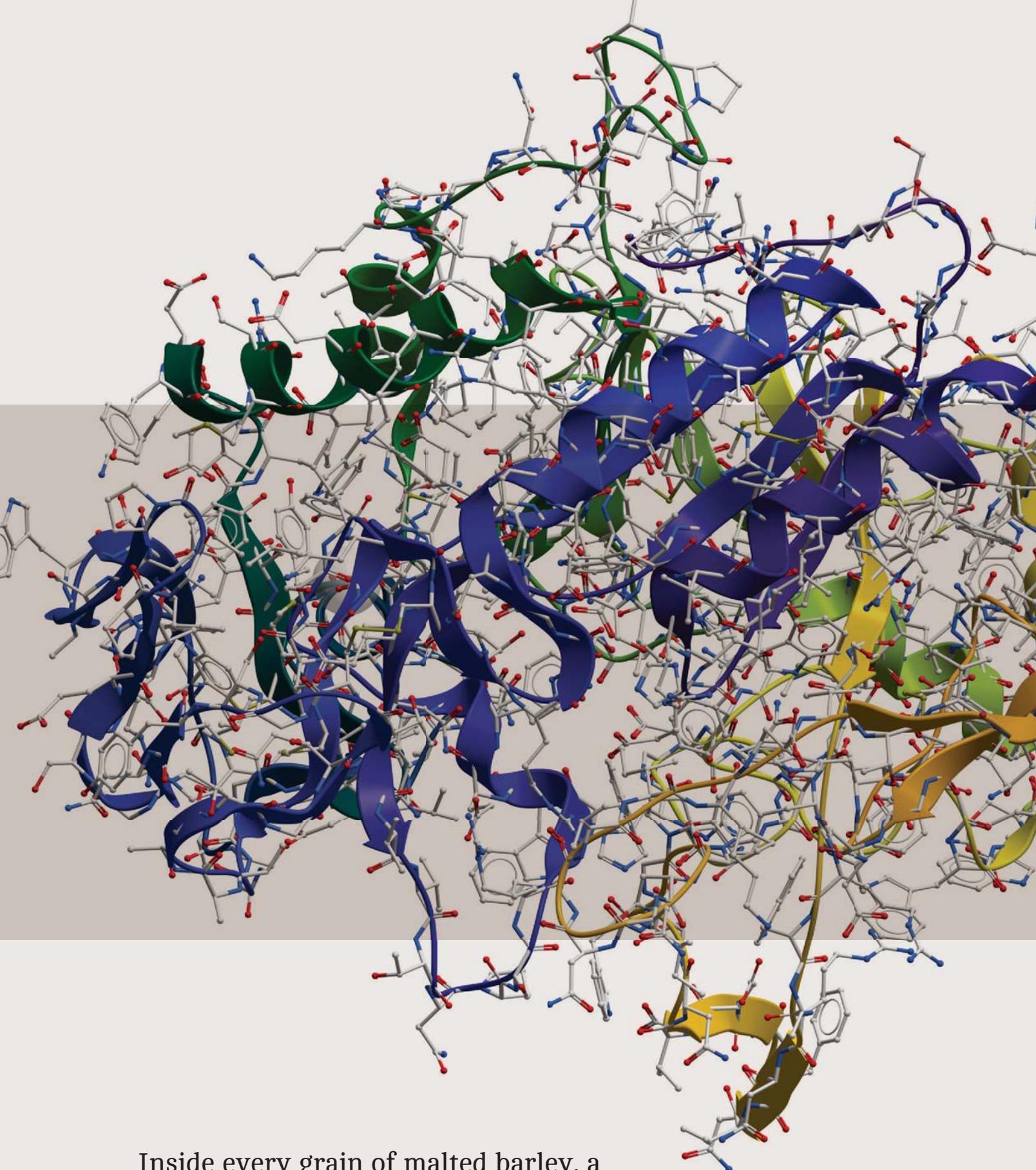
**T**he accompanying recipe, Cane Toad Weisse, allows a fairly wide margin of error on the part of the maltster. As stated previously, it's easy to make passable malt at home, but it's difficult to make malt with enzyme content on par with what you can buy commercially. So, don't be too disappointed if your first batch doesn't have quite the diastatic power you've come to expect from store-bought wheat malt.

My second and third batches were much better than my first attempt, which yielded such a low initial gravity that I had to resort to adding a bit of sugar in the kettle (though this was also a result of milling it too coarsely—see the brewing notes in the recipe). But it also turned out to be a fantastic beer, so I've included it.

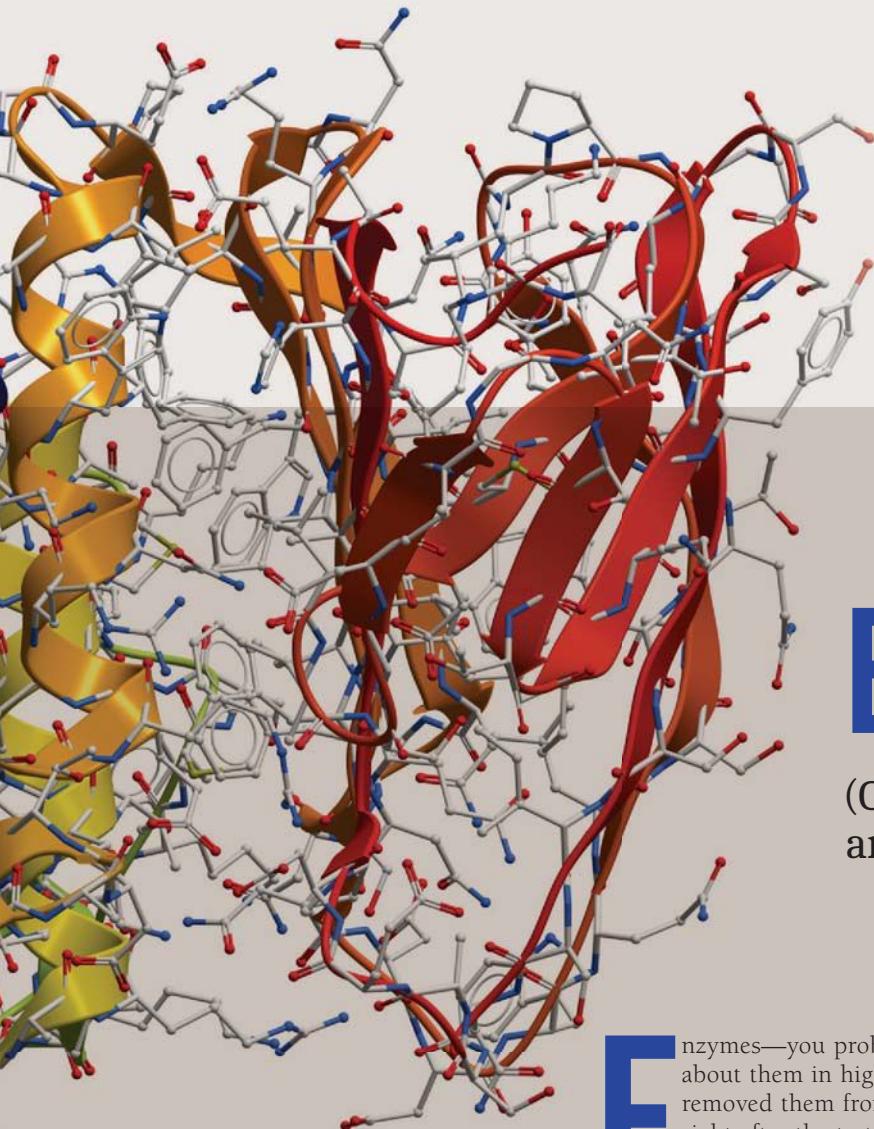
“  
You  
probably  
won't need  
a silo to  
store the  
quantities  
you malt  
at home.

My undermodified homemade wheat malt provided a nice, hefty body to balance the dryness in the finish, and I was proud to use homegrown hops (also undermodified—the listed alpha acid percentage is a conservative guess) that I kilned in the same dehydrator as the wheat malt. May your first batch of home-crafted wheat malt be diastatic and friable!

*Amahl Turczyn is associate editor of Zymurgy.*



Inside every grain of malted barley, a host of naturally occurring enzymes works hard to produce the beers you love.



# ENZYM-URGY

(Or How I Learned to Stop Worrying and Love the Enzyme)

**E**nzymes—you probably learned about them in high school, removed them from your brain right after the test, and quickly replaced them with your favorite quotes from *Anchorman*. Enzymes might have seemed like just another science topic you'd never use in the real world, but once you started homebrewing, you probably realized just how important they are. Inside every grain of malted barley, a host of naturally occurring enzymes works hard to produce the beers you love.

Humans have long used supplemental enzymes to extract fermentable sugars from starches, predating our present infatuation with brut IPA and high attenuation by thousands of years. Indigenous Peruvians chew yuca (cassava) to make a fermented drink called *masato*. The masticated mess of starchy root and saliva is saved in containers where human salivary enzymes

(amylase) break down yuca starches into simpler carbohydrates and sugars, and fermentation commences with the salivary bacteria and yeast.

Rice has offered a source of starch for fermented beverages in China since 1700 BCE and, from the 12th century, to modern Japanese sake. Adding cultures of *koji* (*Aspergillus oryzae*) mold introduces degradative enzymes that convert rice starches to simple sugars.

Adjunct enzymes expanded the variety of fermentable sources of sugar for the ancient human. In modern times, adjunct enzymes offer greater flexibility and specificity of fermentation products when their ideal use and mechanism of action are understood. To detail all the amazing enzymes active at various stages of brewing would take up volumes. Here, we look at six commercially available adjunct enzymes that you, the homebrewer, can use to make the perfect pint.

By John Cuneo and  
Dr. Nicholas Madaffer

## ALPHA-GALACTOSIDASE (AGAL) WITH INVERTASE

Typically associated with chili cookoffs and antacids, alpha-galactosidase (AGAL) with invertase is a dynamic duo of enzymes. Its common marketed use is assisting with the breakdown of flatulence-causing glycolipids and glycoproteins found in dishes featuring the musical fruit, beans. It can be purchased at any supermarket and at most pharmacies under the product name Beano.

### Where It's Found

Naturally secreted by various fermenting organisms, AGAL is commercially purified from *Aspergillus niger*, a common mold. Invertase is commercially derived from yeast but is secreted by bees that use it, along with diastase and amylase, to make honey from nectar.

### Mechanism of Action

Invertase can break down raffinose (a trisaccharide) to form melibiose (a disaccharide) and fructose, and it can also break down sucrose into fructose and glucose.

### ENZYME

An enzyme is a molecule that speeds up a reaction by lowering the energy required for it to occur. One way to visualize this is to imagine cutting apart a tree for firewood. One could use bare hands and an ax (no enzyme), or one could use a chain saw (alpha amylase) and a log splitter (amyloglucosidase). We don't mean to say that Paul Bunyan or his ax is slow and outdated, but an enzyme moves things along much more quickly.

### STARCH

A starch is a complex carbohydrate that enzymes break down to yield simple sugars like sucrose, fructose, maltose, etc. If a starch molecule were a very large, old oak tree, the simple sugars would be the various branches that could potentially be cut off. Some branches are easier and faster to access than the others from the ground (1,6 bond cleavage sites), while others require climbing into the tree to access (1,4 bond cleavage sites).

### ADJUNCT

Adjuncts are alternative sugar sources that may not have any enzymatic potential to convert their own starches. Typical grist adjuncts include corn, rice, sucrose, dextrose, etc. Think of adjuncts as Cousin Eddy pulling up in his RV when you're already cutting down trees. There are now technically more hands to help, but Eddy is more likely to slow down the whole process by stumbling in your way and getting his hand cut off.

Alpha-galactosidase picks up the broken pieces left by invertase and breaks apart melibiose into galactose and glucose. This process takes a starch ordinarily found in whole grains and beans and splits it into three simple sugars easily fermentable by ale yeast (*Saccharomyces cerevisiae*).

Invertase and AGAL optimally work around 55 to 60°C (131–140°F). It is recommended to crush the commercially available tablets, but adding it during the mash versus during primary fermentation is a matter of preference. We would recommend using it during the mash at the optimum temperature for peak enzymatic activity. That said, the crew at Brülosophy conducted an "exBeeriment" in which adding Beano during primary fermentation led to a significant difference in finishing gravity but no significant observable difference in taste.

### How It Affects Your Beer

Using these enzymes will decrease the unfermentable sugars in your beer, thereby increasing the alcohol content, increasing digestibility, and lightening body.

### Best Styles for Use

Light-bodied, crisp, refreshing ales are ideal for these enzymes, given ale yeasts' inability to secrete AGAL. Additionally, the next time you're out to eat some refried beans or a hearty bowl of chili, you might want to keep a tablet or two handy. Your significant other will thank you.

### AMYLASE (ALPHA AND BETA)

Amylase is the enzyme every homebrewer needs to know. While there are other enzymes in the mash that help, amylase's two subtypes (alpha and beta) are the enzymes responsible for converting grain starches into simple sugars yeasts love: glucose, maltose, and maltotriose.

### Where It's Found

Amylase is naturally present in malted barley primarily and, to a lesser extent, in less-modified malts and unmalted adjuncts. Grists with plenty of pale malt should have all the amylase needed for the mash, but if you use a high amount of adjunct, you'll probably need more. The good news? You can also find it at your local homebrew shop! Commercially grown, lab-purified amylase can improve mash yields.

### Mechanism of Action

Alpha and beta amylase work as a team to break complex starches into sugars. Alpha works best at a slightly higher pH and temperature than its counterpart (see facing table). It randomly breaks linkages by hydrolyzing α-1,4 bonds along the straight chains of starches. More simply, alpha amylase just hacks away at the starches.

This is where beta amylase helps. Beta amylase also works on the α-1,4 bonds, but it can only clip one maltose sugar at a time off the ends of the straight chains of starches. As alpha amylase creates more ends of starches by breaking them apart, beta has more ends to work with and can quickly convert them into highly fermentable sugars.

### How It Affects Your Beer

Mashing at temperatures that favor alpha amylase will leave more unfermentable dextrins, resulting in a higher finishing gravity and a fuller body. Slightly lower temperatures help beta amylase work more effectively and yield a more fermentable wort with a lower finishing gravity and a lighter body. But remember: these two enzymes have to work together, and creating an environment in your mash that is too hot or too cold—or a pH that's too high or low—will affect how these two work.

### Best Styles for Use

You can use commercially available amylase in any beer style to help give your mash a boost, but it is especially helpful in beers that have a lot of adjuncts or poorly modified malts. Such components might not have all the diastatic power (i.e. enzymatic power) to convert starches to sugar and may need some help.

### AMYLOGLUCOSIDASE

With the recent explosion in popularity of brut IPA, beer lovers everywhere are rushing to try the next IPA craze (fun while it lasted, NEIPA). Happily for homebrewers wanting to make their own brut IPA, amyloglucosidase is readily available in homebrew shops. It is the same enzyme used to produce high fructose corn syrup.



## Where It's Found

Homebrewers can find a highly concentrated, commercial version of this product derived from *Aspergillus* fungi. White Labs' Ultra Ferm (WLN4100) product claims it "permits total hydrolysis of dextrins to fermentable glucose, from all types of starch." In other words, if you let this enzyme loose in your mash, it will break down all starch derivatives to the smallest sugars.

## Mechanism of Action

Amyloglucosidase is a workhorse. This enzyme primarily cleaves the nonreducing  $\alpha$ -1,4 bonds on the ends of starches, dextrins, and maltose, but can go after the  $\alpha$ -1,6 bonds as well. When used in conjunction with the naturally occurring enzymes in the mash, this enzyme will strip your wort's starches down to their bare glucose skivvies. The result will be increased attenuation (think 1.000 final gravity or less), leaving you with a high-alcohol, low-carbohydrate beer.

## Best Styles for Use

If there isn't an assortment of brut IPA in your favorite beer store now, there probably will be soon. This style is all the rage, but amyloglucosidase has been popular for years with homebrewers for making large beers like boozy imperial stouts more palatable.



### ZYMURGY

Check out Chris Colby's article on brut IPA in the Jan/Feb 2019 issue of *Zymurgy*.

ENZYME	FUNCTION	WHERE TO USE	ACTIVE CONDITIONS	BEER STYLES
alpha-galactosidase & invertase	breaks down raffinose to melibiose and then to glucose, fructose, and galactose	mash or primary fermentation	131–140°F [55–60°C] pH 4.5–5.3	crisp, light ales or stuck fermentations
amylase	converts starches to simple sugars	mash	alpha amylase: 149–162°F [65–72°C] pH 5.3–5.8  beta amylase: 131–150°F [55–66°C] pH 5.0–5.6	beer styles with high amounts of highly modified malts or adjuncts
amyloglucosidase	converts starches, dextrins, and maltose to glucose	mash or before fermentation	Less than 150°F [less than 66°C] pH 3.5–5.5	brut IPA, triple IPA, imperial stout
beta-glucanase	converts glucans to glucose	mash	104–122°F [40–50°C] pH 4.8–5.6	styles with high percentages of rye, oats, or wheat
pectinase	releases fruit juice and removes pectin haze	after the boil	65–150°F [18–66°C] pH 3.0–6.0	fruit beers, cider
proline-specific endoprotease	breaks down chill haze-causing proteins and gluten	primary fermentation	45–85°F [7–29°C] pH 3.0–6.0	any style for which reduced gluten is desired or for which chill haze is problematic

## BETA-GLUCANASE

Beta-glucanase breaks glucans into simpler sugars. Glucans are complex glucose chains found in the cell walls of barley kernels and other whole grains. The dreaded “stuck mash” can result from excessive beta-glucans in the mash because of increased viscosity (stickiness).

Glucans help bind lipids in the bloodstream of humans, provide fiber to keep us regular, and give cell walls some of their structure. For the nutritionists in the crowd, eating oat-derived glucans can decrease low-density lipoprotein (LDL, or “bad cholesterol”) by 5 to 10 percent. Glucans are also considered to be pre-biotics (food for probiotics) for those concerned with gut health.

## Where It's Found

Beta-glucanase is naturally present in malted cereal grains, but it is essentially absent from unmalted grain. It is also available commercially as a derivative from fungus and is traditionally used by winemakers to break down yeast byproducts (polysaccharides and mannoproteins) and to improve color and texture.

## Mechanism of Action

Beta-glucanase is a hydrolase class enzyme

that breaks glucans down into simpler glucose molecules.

## How It Affects Your Beer

Beta-glucanase decreases the viscosity of a mash high in raw, roasted, torrefied, or flaked rye, oats, wheat and, of course, barley. Breaking down glucans aids lautering and assists in filtration potential of a beer.

## Best Styles for Use

Beers with high percentages of rye, wheat, oats or flaked barley can benefit from beta-glucanase.

## PECTINASE

Pectins are complex polysaccharides (big sugars) that are found naturally in many of the fruits most commonly used by homebrewers. While they're not so great for your beer, pectins are widely used to thicken jams and jellies.

So why don't we like them in beer? Well, for one thing you don't want your beer to be a jelly. But pectins also leave an undesirable haze commonly referred to as “pectin haze.” Pectinase breaks down pectins to promote clarification of your fruit beer. Additionally, by helping

break down the cell walls of the fruit, it allows for the release of some of the fruit's juices and other fruit characteristics you're looking for in your beer. If you brew with fruit, you probably need to invest in some pectinase.

## Where It's Found

Pectinase occurs naturally in fruit; however the commercially available enzyme is grown up like most enzymes, using an *Aspergillus* fungus in the laboratory.

## Mechanism of Action

Pectins are complex sugars composed of chains of D-galacturonic acid linked by  $\alpha$ -1,4 bonds, present in plant cell walls. It is best to use this enzyme after the boil, when wort is cooler, to prevent the enzyme from denaturing.

## How It Affects Your Beer

Pectinase helps you get the flavor you want out of your fruit while keeping your beer crystal clear.

## Best Styles for Use

These days, homebrewers add fruit to just about any beer they can. Our advice: any style with fruit needs some pectinase.

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## PROLINE-SPECIFIC ENDOPROTEASE

Certain proteins found in cereal grains can trigger an inflammatory state in human digestive systems leading to cramps, nausea, vomiting, diarrhea, bloating, and flatulence. This type of inflammatory state is most commonly triggered by gluten proteins in people afflicted with celiac disease and, to a lesser extent, in those with gluten sensitivity. Certain enzymes can break these proteins into smaller peptides that are less likely to cause reactions.

The safe alternative to brewing with cereal grains containing gluten (barley, wheat, and rye) is to use those without gluten such as oats, buckwheat, sorghum, millet, quinoa, and rice. However, savvy chemists and food scientists have produced an enzyme that targets gluten to such an extent that, when used in typical grists, it can lower the laboratory-detectable amount of gluten to less than 20 parts per million (ppm). The 20 ppm threshold is the international target for calling a food “gluten free.” The enzyme also helps clarify and stabilize beer by breaking down polypeptides associated with chill-haze proteins.

### Where It's Found

Commercially derived from *Aspergillus niger*, proteases are also present in malted

cereal grains. It is available to homebrewers as White Labs Clarity Ferm and to professionals as DSM Brewers Clarex.

### Mechanism of Action

Endoproteases cleave proteins into smaller peptides but cannot chop proteins into the most basic amino acids. They differ in that regard from exoproteases. A way to understand this function is to visualize how it's easier to break a stick in half than it is to snap off a small piece from the very tip: endoproteases work in the middle of proteins and not at the tips. They are most active at fermentation temperatures.

### How It Affects Your Beer

Using a proline-specific endoprotease can decrease chill haze and lower the gluten content of your beers. We would, however, strongly caution you against calling them “gluten-free” with friends who have celiac disease or gluten sensitivity, as it's more accurate to use the term “gluten-reduced.” True gluten-free brewing involves a whole world of malted cereal grains without gluten in the first place. (For more on true gluten-free brewing, see “Zero Tolerance” in this issue of Zymurgy.)

## Best Styles for Use

Any style of beer where chill haze is a concern or where one would like to reduce their gluten intake can benefit from endoprotease.

Enzymes are important to homebrewing, and those discussed here are the most common commercially available examples. Understanding the chemistry of adjunct enzymes is increasingly valuable as more enzyme products become available to homebrewers. Knowing more about enzymes lets us push the boundaries of homebrewing and increase the quality of our home-crafted beverages.

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# ZERO TOLERANCE

Brewing *Truly* Gluten-Free Beer



*By Joe Morris*

**M**any brewers view a disease like celiac or non-celiac gluten intolerance as a career ender. In actuality, nothing could be further from the truth. For many of us, a medical diagnosis opens the door to one of the greatest and most fulfilling challenges a brewer can face: learning to brew truly delicious beer without using barley, wheat, or rye.

If you brew gluten-free beer, chances are someone told you that you have to do it that way. No one really seeks out gluten-free brewing as a first option. There is an inside joke among gluten-free brewers that it's "twice as hard and four times more expensive." It's not for the faint of heart.

The most common paths to gluten-free homebrewing are threefold.

- Often, an **established homebrewer** will receive a medical diagnosis (food allergy, celiac disease, gluten intolerance, or some other autoimmune condition) that forces the brewer to remove gluten from his or her life.
- Others find themselves living with a preexisting diagnosis and decide to take matters into their own hands. They miss drinking beer and are determined to take up the gauntlet themselves. These folks can be called **native gluten-free homebrewers** as they have no previous brewing experience with traditional fermentables.
- The third path we see are brewers who brew gluten-free as **an act of service for others**, often loved ones. Brewers who can brew and drink traditional beers but take their time and energy to brew a beer that is safe for someone who suffers from a gluten-related diagnosis provide a real gift to that beer drinker. It

is not uncommon, and some have even gone on to do this professionally.

We face a certain set of challenges as gluten-free brewers, largely concerning the fermentable ingredients available to us. All-grain gluten-free brewers use both malted and unmalted grains like millet, rice, and buckwheat in the grist. Extract brewers are limited to sorghum, brown rice, sugars, and syrups.

### **GLUTEN-FREE VS. GLUTEN-REDUCED**

A topic gluten-free brewers frequently contend with is the use of Clarity Ferm. (For more on Clarity Ferm, see "Enzymurgy" in this issue of *Zymurgy*.) Commercial breweries have been touting beers brewed with barley and then enzymatically treated with Clarity Ferm (Brewers Clarex) as "safe" for those with gluten intolerance or even celiac disease.

The fact is these beers are brewed with gluten-derived ingredients and are therefore *not* gluten-free. It is an important distinction. Though these beers may pass the standard test used to determine detectable levels of gluten in the food industry, there are no assurances that the test is reliable in the presence of alcohol. Further, there are liquid chromatography-mass spectrometry (LC-MS) test cases by Dr. Michelle Colgrave which directly refute those claims.<sup>1</sup>

There is also the issue of cross contamination. Even if a person with gluten intolerance or celiac disease were able to consume commercially packaged "gluten-reduced" beer, the very process of brewing these

beers would pose a threat to a gluten-intolerant brewer. When a person has a physiological reaction to gluten, handling 50-pound bags of barley, milling grains—thereby throwing barley dust into the atmosphere—and tasting untreated samples make a reaction unavoidable.

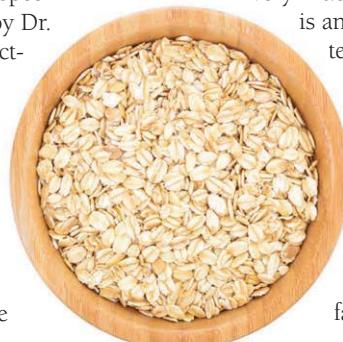
Gluten-free beer—truly gluten-free beer made with no gluten-derived ingredients—is improving so quickly that there is no longer a reason to risk consuming so-called gluten-reduced beer if you don't want to.

Some of the gluten-free homebrews being brewed today are scoring in the mid to high 30s in competitions at the local and state level, and even at the National Homebrew Competition. Gluten-free beers are earning those scores in categories in which they compete against traditional barley beers (there are currently no gluten-free BJCP categories).

Zero Tolerance, the dedicated gluten-free homebrew club I founded, served 11 different gluten-free offerings at Homebrew Con across three different events. The beers drew great interest, and the feedback was overwhelmingly positive among some of the most discerning homebrewers you'll find.

While the beer we brew is starting to catch up to the beer made by our wheat-eating counterparts, the processes are still

very much under development. This is an exciting time to be a gluten-free brewer: recipe design and brewing methods for gluten-free brewing are still very much on the bleeding edge. When you consider that the entire history of gluten-free brewing has taken place in the past 10 to 15 years, it is amazing how far things have come.



## INGREDIENTS AND PROCESSES

Our unique ingredients bring a special set of process challenges. Gluten-free malted grains are far more difficult to mash than barley, wheat, or rye. One reason is that the saccharification and gelatinization temperatures of malted millet, buckwheat, and rice generally do not align as they do for malted barley, wheat, and rye.

In every case, the gelatinization temperature (the temperature at which a grain's starch becomes fully soluble and ready for conversion) is high enough to denature the natural amylase enzymes inherent in the grain. This calls for (1) complicated step-mash routines wherein a portion of cool wort is decanted and reserved (decantation mash), (2) the addition of commercially available industrial enzymes, or (3) some combination of both.

There is no one, universally accepted mash technique, and the risk of failure is far higher than it is with traditional grains.

This is both exciting and frustrating, as failed or delayed conversion in gluten-free brewing is a real possibility, even when best practices are followed.

Further, millet and buckwheat husks are extremely delicate. Malted rice and the addition of rice hulls can make things a bit easier, but stuck mashes are another very real threat on any given batch.

Extract brewing also brings its own set of challenges because of the flavors of common gluten-free malt syrups. Sorghum has a distinct, metallic flavor that, when fermented, is easily perceptible to the traditional beer drinker. If you brew with sorghum, you will have to confront this off taste. People go to great lengths with adjuncts, hops, and fruit to mask it. Some brewers are great at this, and commercially brewed sorghum beers regularly win national awards at the Great American Beer Festival.

Brown rice syrup can carry over into the finished beer as well. Its flavor is

one I associate with Kind bars and other health food products, in which brown rice syrup is commonly used. Both are far more fermentable than barley malt extracts, and maltodextrin is often employed to retain some sweetness and body in the finished beer.

Despite all these challenges, it is possible for brewers of any level of experience to succeed in gluten-free brewing. And we need more brewers to help build this nascent area of homebrewing because the more of us there are, the better everyone else's beer will be.

## COMMUNITY SUPPORT

Apart from limitations on ingredients, we also often face difficulty finding community support. Before I was diagnosed with celiac disease, I was an active member of the PDXBrewers homebrew club. More than anything, I loved sampling and sharing beer with my club. Feedback in those meetings did so much to improve my beer,



## THE SON OF GRAPEFRUIT XTRA PALE ALE

*American pale ale*

Recipe courtesy Bob Keifer

This is a great recipe that I've come back to a couple times and brewed in multiple ways. Anytime you need a good drinking beer, this is a go-to, and it is usually affordable. It's modeled after one of Ghostfish Brewing Co.'s most-awarded flagships, Grapefruit IPA.

Zero Tolerance members demonstrated this beer for a seminar and club night at Homebrew Con. I wanted a recipe that people would find difficult to distinguish between all-grain and extract, but would still be easier to source than other gluten-free recipes.

The toughest part is getting around the flavors that sorghum produces. Many claim to taste a metallic or chlorophenolic "twang" when they try sorghum beers. That is why we rely on grapefruit-tasting Yakima Valley Hops Experimental Grapefruit hops and, optionally, grapefruit peel. By leaning into the flavor, we're making something undesirable desirable.

I suggest using yeast nutrient since dry yeast sometimes has trouble finishing sorghum. It'll help achieve full attenuation when you do start using grain.

This recipe tastes great with the zest of one grapefruit in secondary. Just soak the zest in vodka while primary fermentation takes place and add the entire tincture to secondary along with the dry hops.

**Batch volume:** 5 US gal. (18.9 L)

**Original gravity:** 1.051 (12.6°P)

**Final gravity:** 1.011 (2.8°P)

**Color:** 8 SRM

**Bitterness:** 60 IBU

**Alcohol:** 5.2% by volume

### FERMENTABLES

**3 lb.** [1.36 kg] sorghum syrup

**3 lb.** [1.36 kg] brown rice syrup

**1 lb.** [454 g] D-45 amber candi syrup

**0.5 lb.** [227 g] tapioca maltodextrin

### HOPS

**0.5 oz.** [14 g] CTZ, 15.5% a.a. @ 60 min

**1 oz.** [28 g] Yakima Valley Exp. Grapefruit, 15% a.a. @ 15 min

**1 oz.** [28 g] Yakima Valley Exp. Grapefruit, 15% a.a. @ 0 min

**2 oz.** [28 g] Yakima Valley Exp. Grapefruit, dry hop 4 days

### YEAST

Fermentis SafAle US-05

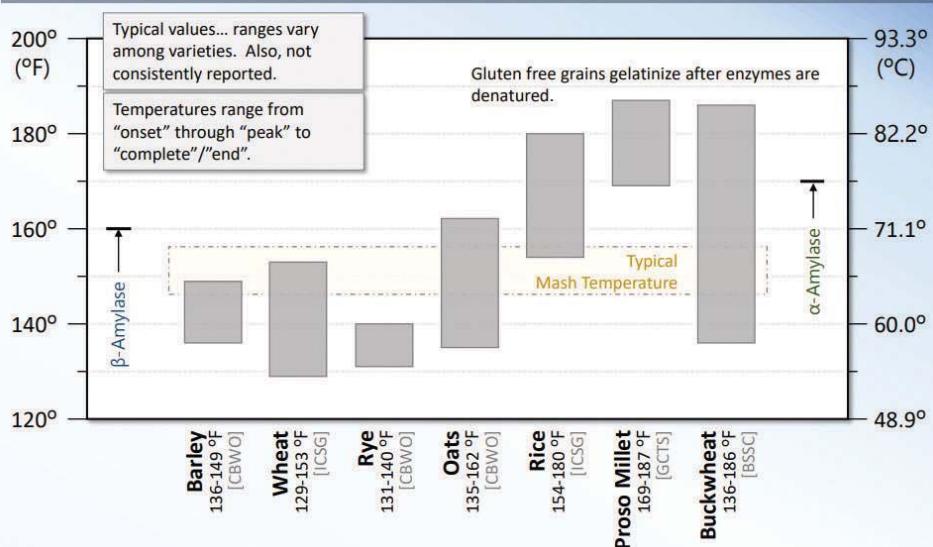
### OPTIONAL ITEMS

Zest of one grapefruit

### BREWING NOTES

Dissolve all fermentables in hot water and bring to a boil. Boil 60 minutes, adding hops as indicated. Ferment at 68°F (20°C).

# Gelatinization Temperature Ranges



and I like to think I provided valuable feedback to my fellow club members as well.

After my diagnosis, I would take my gluten-free homebrews to the club. Members had positive, encouraging things to say but no real actionable feedback. They did not know my ingredients, and they could not make suggestions on process because they had no experience brewing this way. I also truly missed being able to taste their beer and provide my feedback to them. I needed a place where I could taste gluten-free beers from other homebrewers, share my beer, and receive the feedback I needed to improve.

Luckily, I live in Portland, which is very much a gluten-free mecca. Five of the 12 dedicated gluten-free breweries in North America are in the Pacific Northwest. I approached Ground Breaker Brewing, the nation's first dedicated gluten-free brewery, and asked if they would be interested in hosting a dedicated gluten-free homebrew club. As it turned out, they had been looking for someone to start one. Suddenly, we had our home.

Zero Tolerance Gluten Free Homebrew Club was founded in January 2018 and has since gone on to represent gluten-free beer at Homebrew Con and on podcasts. We've reached an online membership exceeding 350 across five continents. We meet in person on the last Sunday of every month at Ground Breaker, and our meetings are webcast online. If you are interested in learning to brew gluten-free beer or are an established gluten-free brewer, find us at zerotolerancebrewing.com and on Facebook at facebook.com/groups/ZeroToleranceGF.

Three notable brewers from our club have shared the recipes that accompany this article. The Son of Grapefruit Xtra Pale Ale is a simple extract beer perfect for the entry-level brewer. Dad's Red Ale is a tried-and-true, award-winning recipe with intermediate all-grain techniques. And,



## DAD'S RED ALE

*American amber ale*

Recipe courtesy Joe Morris

My dad gave me my first homebrew kit. To say thanks, I would always make him an amber ale or red ale when he would come to visit. But after I went gluten free, getting a similar red hue and chewy malt flavor into a beer proved challenging.

Nonetheless, my gluten-free version won Ground Breaker's 1st Annual Pacific Northwest Gluten-Free Homebrew Competition. It went on to score a 36 in the First Round of the National Homebrew Competition and recently won a blue ribbon at the Oregon State Fair. It's a tasty beer and, most importantly, Dad loves it.

If the color turns out less red than desired, add small amounts of D-90 candi syrup for color.

**Batch volume:** 5 US gal. (18.9 L)  
**Original gravity:** 1.068 (16.6°P)  
**Final gravity:** 1.013 (3.3°P)  
**Color:** 15 SRM  
**Bitterness:** 44 IBU  
**Alcohol:** 7.3% by volume

### GRAINS

**10 lb.** (4.54 kg) Grouse Pale Millet Malt  
**1.5 lb.** (680 g) Grouse Munich Millet Malt  
**1 lb.** (454 g) Grouse Roasted Caramillet  
**12 oz.** (340 g) Grouse Crystal Millet 10L  
**12 oz.** (340 g) Eckert James' Rice Malt  
**8 oz.** (227 g) Grouse Buckwheat Malt  
**8 oz.** (227 g) Eckert Crystal Rice Malt 15L  
**4 oz.** (113 g) Grouse Chocolate Millet

### HOPS

**0.25 oz.** (7 g) CTZ @ 60 min (13 IBU)  
**0.5 oz.** (14 g) Cascade, 7% a.a. @ 10 min  
**0.5 oz.** (14 g) Centennial, 10% a.a. @ 10 min  
**0.5 oz.** (14 g) Cascade, 7% a.a., whirlpool 20 min  
**0.5 oz.** (14 g) Centennial, 10% a.a., whirlpool 20 min  
**0.5 oz.** (14 g) Amarillo, 8% a.a., whirlpool 20 min  
**0.5 oz.** (14 g) Simcoe, 12% a.a., whirlpool 20 min

### YEAST

Fermentis SafAle US-05 (dry yeast is gluten free)

### ADDITIONAL ITEMS

**20 mL.** (0.7 oz) Termamyl alpha amylase  
**1 lb.** (454 g) rice hulls  
**20 mL.** (0.7 oz) SebAmyl L alpha amylase  
**2 Tbsp.** (30 mL) Wyeast yeast nutrient

### BREWING NOTES

Reverse step mash 30 min. at 185°F (85°C) with 20 mL Termamyl (a heat-tolerant alpha enzyme) for gelatinization. Then rest for 60–90 min. at 155°F (68.3°C) with 20 mL SebAmyl L for saccharification. Recirculate until wort is clear and passes an iodine starch test. Sparge, boil 60 min., cool to 65°F (18.3°C), transfer, and ferment at 65°F (18.3°C) until gravity stabilizes.



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finally, Oaked Wee Heavy is an over-the-top, extremely difficult, all-grain, decantation-mashed beast of a beer that only my friend Ed Golden would ever consider brewing. It's also the best gluten-free beer I have ever tasted.

To me, these beers demonstrate why naturally gluten-free ingredients offer a great alternative to brewing with traditional malts. When people ask, "Why not just use an enzyme?", you can answer, "Why would I? I can make great beer without it."

## RESOURCES

1. Lemonick, Sam. "A New Test to Make Sure Your Beer Is Gluten Free." Forbes. <http://www.forbes.com/sites/samlemonick/2017/11/01/a-new-test-to-make-sure-your-beer-is-gluten-free/#793a41b41981> (Accessed January 7, 2019).

*Joe Morris has been brewing at home since 2011. In 2017, he was diagnosed with celiac disease, and in January 2018 he founded Zero Tolerance Gluten Free Homebrew Club a dedicated gluten-free homebrew club based in Portland, Ore.*



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# OAKED WEE HEAVY

## Strong Scotch ale

Recipe courtesy Ed Golden

My gluten-free version of this uncommon style has a striking color, savory aroma, and malty flavors with mild caramel, subtle chocolate, and fruit esters. Oak adds vanilla and complexity, even if it's not strictly to style.

**Batch size:** 4 US gal. (15.1 L)

**Original gravity:** 1.091 (21.8°P)

**Final gravity:** 1.028 (7.1°P)

**Bitterness:** 22 IBU

**Color:** 21 SRM

**Alcohol:** 8.2% by volume

### MALTS AND SUGARS

**6.5 lb.** (2.95 kg) pale millet malt

**5.0 lb.** (2.27 kg) Munich millet malt

**8 oz.** (227 g) rolled oats

**8 oz.** (227 g) chocolate millet malt

**1.5 lb.** (680 g) maltodextrin, end of boil

**1 lb.** (454 g) D-45 candi syrup, end of boil

### HOPS

**1 oz.** (28 g) Fuggle, 4.5% a.a. @ 60 min

### YEAST

**2 sachets** Fermentis SafAle S-04

### ADDITIONAL ITEMS

**0.25 oz.** (7–10 mL) SebAmyl L beta amylase

**1 lb.** (454 g) rice hulls

**0.2 oz.** (6 g) yeast nutrient

**2 oz.** (57 g) medium-toast oak cubes

### BREWING NOTES

Use a decantation mash for a dry beer. Conduct a beta-glucan rest at 104°F (40°C). Raise to 150°F (66°C) for 45 minutes. Save clear, enzyme-rich wort after the grist settles. Heat cereal to 200°F (93°C) for 15 minutes to gelatinize—don't scorch it. Recombine to 150°F (66°C) and add beta amylase and rice hulls. Hold one hour, lauter, and sparge. Collect 6 gallons (22.7 L) of wort, and boil to yield 4 gallons (15.1 L), about 3 hours.

Add a few grams of yeast nutrient and ferment at 64°F (18°C). The cool fermentation suppresses boozy flavors, but some esters are desirable. This beer may finish drier than expected.

After primary fermentation, transfer beer to a secondary carboy with the oak cubes and condition for 28 days before bottling or kegging.

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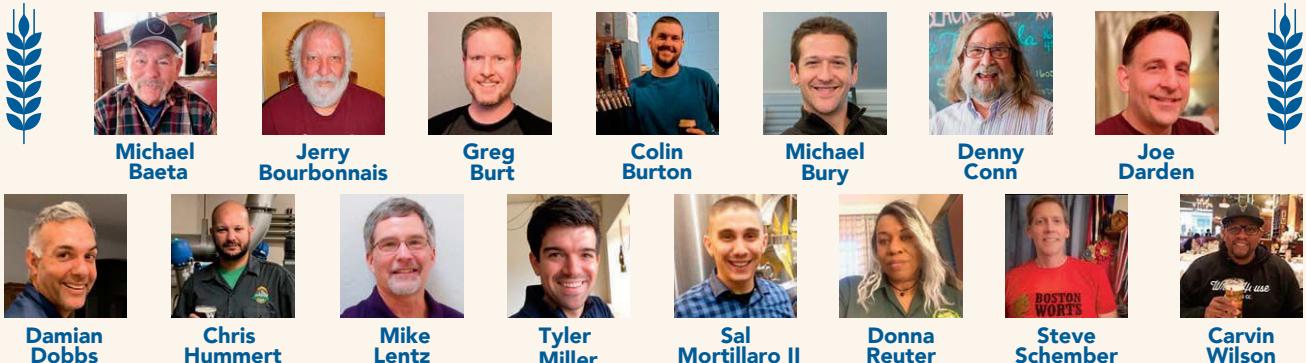
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# Second Annual Big Beer Bonanza Homebrew Competition

By Amahl Turczyn

**O**n Tuesday, December 11, 2018, the San Antonio Cerveceros Craft Beer Community, in collaboration with Künstler Brewing of downtown San Antonio, Texas, hosted the Big Beer Bonanza homebrew competition. According to organizer and club president David Medlin, the San Antonio Cerveceros are a 501(c)(3) nonprofit homebrew organization established in 2010, focused on homebrew education and independent craft beverage awareness and promotion. That includes homemade wine, cider, and mead in addition to beer.

"This is the second such event that the San Antonio Cerveceros has done in collaboration with Künstler Brewing," Medlin said. The craft brewery recently won a silver medal at the Great American Beer Festival (GABF) for its Chamuco Spiced Porter. In addition to providing the venue by hosting the competition at its San Antonio location, Künstler also generously donated part of the top prize: the best-of-show (BOS) brewer would have the opportunity to brew his or her winning beer on Künstler's professional system side →





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# Fortis Exordium

## Strong English Ale

Recipe courtesy Chris Daily, Best of Show, Big Beer Bonanza Homebrew Competition

**Batch volume:** 5.5 US gal. [20.8 L]

**Original gravity:** 1.088 [21.3°P]

**Final gravity:** 1.023 [5.8°P]

**Efficiency:** 75%

**Bitterness:** 32 IBU

**Color:** 33 SRM

**Alcohol:** 8.6% by volume

### MALTS AND SUGARS

11.75 lb. [5.33 kg] UK Maris Otter malt

1.83 lb. [830 g] German light Munich malt

0.78 lb. [354 g] Belgian CaraVienne malt

0.78 lb. [354 g] UK amber malt

0.78 lb. [354 g] UK 70°L crystal malt

0.78 lb. [354 g] UK chocolate malt

0.44 lb. [200 g] molasses @ 10 min

2.35 oz. [67 g] Special B malt

1 oz. [28 g] roast barley

### HOPS

0.78 oz. [22 g] Target, 11% a.a.

@ 60 min [20 IBU]

0.78 oz. [22 g] EK Goldings, 5% a.a.

@ 40 min [8 IBU]

0.78 oz. [22 g] Bramling Cross, 6% a.a.

@ 10 min [4 IBU]

0.19 oz. [22 g] Saaz, 4% a.a. @ 1 min (<1 IBU)

0.59 oz. [17 g] Tettnanger, 4.5% a.a. @ 0 min

### ADDITIONAL ITEMS

0.5 tsp. [1.5 g] yeast nutrient @ 15 min

1 tablet Whirlfloc @ 15 min

### WATER

Aim for a mash water profile of Ca 102 ppm, Mg 10 ppm, Na 23 ppm, Cl 148 ppm, SO<sub>4</sub> 90 ppm, with a chloride-to-sulfate ratio of 1.64.

### YEAST

White Labs WLP 007 Dry English Ale Yeast

### BREWING NOTES

Mash at 156°F (69°C) for 60 min. Boil 90 min. Add molasses 10 minutes before flameout.

### EXTRACT VERSION

Substitute Maris Otter malt with 9.25 lb. (4.2 kg) Maris Otter malt extract syrup and Munich malt with 1.5 lb. (680 g) Munich malt extract syrup. Steep remaining grains at 155°F (68°C) for 30 minutes. Drain, rinse grains, and dissolve malt extract syrups into the resulting wort. Top off with reverse osmosis water to desired boil volume, boil, and add molasses as above.

Medlin would “like to see that move” for subsequent competitions, to “potentially attract AHA members from around the world.” Instead, committed members of the hosting craft brewery’s mug club had the honor of choosing winners from among the entries received.

Judging was performed by over 20 Stammtisch members of Künstler Brewing, who were very thorough with their judging and filled out comment cards for all submissions.” Apparently, there were some high-quality entries to the event, as competition was fierce, and it was difficult for judges to choose a top prize winner.

“This contest was actually rather close in regards to votes, with a tie occurring for first

place,” Medlin said. “With the help of some blind taste testers we were able to successfully break that tie and declare a winner.”

That winner was Chris Daily of the San Antonio Cerveceros, who won top prize at this year’s Big Beer Bonanza with a strong English ale he dubbed Fortis Exordium. The burly ale had already won him silver at the Bluebonnet Brewoff. Daily has been brewing for three years, after a neighbor introduced him to the popular brew-in-a-bag method. Since then, Daily’s uncle Randy has been his mentor, educating and inspiring him to brew, enter competitions, and compete.

“My Uncle Randy Daily is my brew Yoda!” stated Daily. “He has truly educated

→ by side with head brewer and owner Vera Deckard. And if those bragging rights weren’t enough, the BOS winner is also able to buy the beer while it’s on tap at the craft brewery for only two dollars.

Competition entries to this celebration of high-strength homebrew had to be at least 1.085 OG (20.5°P)—no limit was imposed on maximum gravity, but competition rules did set an ingredient spending limit of \$100 for a 5-gallon (18.9-liter) batch—so \$2 for a commercially brewed pint is a bargain price for a monster beer.

There were also no style limitations, although out of respect for Künstler Brewing, competition rules did include the caveat, “Any additions to the beer MUST be something that can be purchased on a large scale by the brewery; very rare ingredients are not something the brewery can feasibly obtain.” So, save that Spanish saffron eisbock for the National Homebrew Competition!

While 2018’s Big Beer Bonanza was a relatively small event at around 15 entries, Medlin plans to continue his club’s efforts at spreading homebrew and craft brew awareness by expanding both the number and size of the competitions they host with Künstler.

“Going forward, the Cerveceros will be cohosting biannual events, each with a different focus in an effort to explore the many styles of beer.” Medlin also stated that it will be a goal of the Cerveceros to involve local charities in the event to give back to the community.

This year’s event was not sanctioned by the BJCP/AHA, but that will change—

“  
Learn how to adjust  
the water profile for each  
beer. Doing so has been  
the difference between  
good homebrew and  
competition-winning beer.

— Chris Daily, San Antonio Cerveceros

and inspired me to brew bigger, better beer and to compete at Bluebonnet and other Lone Star Circuit competitions.” Daily brews with a 60-quart (56.8-liter) Igloo cooler cube with a chlorinated polyvinyl chloride (CPVC, similar to PVC) pipe manifold and Bazooka screens, and he boils in a BrewBuilt kettle.

When it comes to the kind of beers he likes to brew, he relishes a high degree of brewing difficulty. “I like brewing complicated recipes that make you think,” he explained. “I like the challenge of multiple mash or hop schedules.”

As for beers he likes to drink, “I’ve been really into German style beers lately. I just finished brewing a rogenbier that I can’t wait to try.”

The recipe for Fortis Exordium was inspired by Gordon Strong, who was also heavily influential to Daily’s recent successes. “His recipes are the foundation on which mine are built,” he modestly admitted of Strong. “I wouldn’t have my recipes without his guidance. Thank you!”

Daily’s own tips for brewing successful strong ales? “Aging is incredibly important. I’ve experimented trying high-gravity (non-



Chris Daily won top prize at this year's Big Beer Bonanza.

IPA) beers each month for a year. It may taste good a month after fermentation, but it’ll taste great if you wait.” He’s also a firm believer in brewing with the right water. “Learn how to adjust the water profile for each beer,” he urged. “For me, doing so has been the difference between good homebrew and competition-winning beer.”

No doubt that attention to detail will come in handy when Daily brews his English strong at Künstler in March.

*Amahl Turczyn is associate editor of Zymurgy.*



# Relax, Don't Worry, Have a Homebrew!



That mantra rings as true today as it did in 1978 when Charlie Papazian cofounded the American Homebrewers Association with Charlie Matzen. Homebrewing can be as simple or as complex as you want to make it, but the first step is always to relax and not worry.

To aid your relaxation and help you get the most out of Zymurgy, here are some standard assumptions and methods for our recipes. Of course, when a recipe says to do something different, follow the recipe. But you can always fall back on these general tips to brew great beer.



## ON THE WEB

For more detailed info, head over to [HomebrewersAssociation.org](http://HomebrewersAssociation.org) and dive into our How to Brew resources.

## BREWING WITH ZYMBURGY

### MAKING WORT

Most recipes in Zymurgy offer an all-grain version and a malt extract or partial-mash alternative. Pick the procedure you prefer and prepare some wort!



### Malt Extract Recipes

Making wort from malt extract is easy.

- Crush specialty grains.
- Place milled grains in a mesh bag and tie it off.
- Steep the bag of grains in 150–160°F (66–71°C) water for 30 minutes in your brew pot.
- Remove the bag of grains from the pot.
- Fully dissolve the malt extract in your hot, grain-infused water.
- Top up with water to your desired boil volume. (Leave some room for foam!)

### All-Grain and Partial-Mash Recipes

Unless otherwise specified, all-grain brewers can conduct a single-temperature infusion mash with these parameters:

- Water/grain ratio: 1.25 qt./lb. (2.6 L/kg)
- Mash efficiency: 70%
- Mash temperature: 150–153°F (66.7–67.2°C)
- Mash duration: 60 minutes

Partial-mash recipes make the same assumptions, just using a smaller amount of grain and augmenting the small batch of wort with malt extract.

### BOILING

No matter how you get here, everyone loves adding hops.



- Boil time is 60 minutes.
- Boils are assumed to be the full batch volume, but you can also boil a concentrated wort and top up with water in the fermenter.
- Hop additions are given in minutes before the end of the boil.

# Brew Lingo

Every field has specialized language, and homebrewing is no different. Here are some of the key terms, abbreviations, and acronyms you'll find throughout Zymurgy.

**AA** – alpha acid

**ABV** – alcohol by volume

**AHA** – American Homebrewers Association

**BBL** – US beer barrel [31 US gal or 117.3 L]

**BIAB** – brew in a bag

**BJCP** – Beer Judge Certification Program

**Chico** – American ale yeast, AKA Wyeast 1056, WLP001, SafAle US-05, and others

**CTZ** – Columbus, Tomahawk, and Zeus: interchangeable high-alpha-acid hops

**DME** – dry malt extract

**DMS** – dimethyl sulfide, an off flavor similar to canned corn or cooked vegetables

**DO** – dissolved oxygen

**EBC** – European Brewing Convention (beer color)

**FG** – final gravity

**FWH** – first wort hops, added to the boil kettle as it fills with sweet wort after mashing

**HERMS** – heat exchange recirculating mash system

**HLT** – hot liquor tank

**IBU** – international bitterness unit

**LHBS** – local homebrew shop

**°L** – degrees Lovibond (malt color)

**LME** – liquid malt extract

**MLT** – mash-lauter tun

**NHC** – National Homebrew Competition

**OG** – original gravity

**°P** – degrees Plato (density of wort or beer)

**RIMS** – recirculating infusion mash system

**RO** – reverse osmosis, a water purification process that removes most dissolved ions

**SG** – specific gravity (wort/beer density)

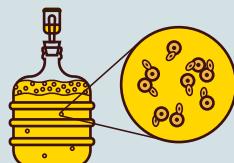
**SMaSH** – single malt and single hop

**SMM** – S-methyl methionine, precursor to dimethyl sulfide (DMS)

**SRM** – Standard Reference Method (beer color)

## FERMENTING AND CONDITIONING

Pitch yeast to chilled wort to make the magic happen.



- Use twice as much yeast for lagers as you do for ales.
- Ales ferment at 60–70°F (15–20°C).
- Lagers ferment at 45–55°F (7–13°C).
- Condition ales at room temperature or colder for a week or two.
- Condition lagers at close to freezing for several weeks.

## BOTTLING AND KEGGING

If you bottle,

- Use 1 oz. of dextrose (corn sugar) per gallon of beer (7.5 g/L) for a good, all-purpose level of CO<sub>2</sub>.
- Use less sugar for less fizz.



- Take care with higher carbonation levels—many single-use beer bottles aren't designed for high pressure.

### If you keg and force carbonate your beer,

- Use the chart to dial in the pressure on the regulator.



- Add 0.5 psi (35 mbar) for every 1,000 feet (300 meters) you live above sea level.
- To convert psi pressures to mbar, multiply by 69.
- To convert volumes of CO<sub>2</sub> to g/L, multiply by 2.

## REGULATOR PRESSURES (PSI) FOR VARIOUS CARBONATION LEVELS AND SERVING TEMPERATURES

TEMP. (°F)	VOL. CO <sub>2</sub>										
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
33	5.0	6.0	6.9	7.9	8.8	9.8	10.7	11.7	12.6	13.6	14.5
34	5.2	6.2	7.2	8.1	9.1	10.1	11.1	12.0	13.0	14.0	15.0
35	5.6	6.6	7.6	8.6	9.7	10.7	11.7	12.7	13.7	14.8	15.8
36	6.1	7.1	8.2	9.2	10.2	11.3	12.3	13.4	14.4	15.5	16.5
37	6.6	7.6	8.7	9.8	10.8	11.9	12.9	14.0	15.1	16.1	17.2
38	7.0	8.1	9.2	10.3	11.3	12.4	13.5	14.5	15.6	16.7	17.8
39	7.6	8.7	9.8	10.8	11.9	13.0	14.1	15.2	16.3	17.4	18.5
40	8.0	9.1	10.2	11.3	12.4	13.5	14.6	15.7	16.8	17.9	19.0
41	8.3	9.4	10.6	11.7	12.8	13.9	15.1	16.2	17.3	18.4	19.5
42	8.8	9.9	11.0	12.2	13.3	14.4	15.6	16.7	17.8	19.0	20.1

■ = PSI

Source: Brewers Association Draught Beer Quality for Retailers



# Sanctioned Competition Program

## JANUARY 2018

Bataille des Bières Homebrew Competition,  
41 entries

*John Paul, Lafayette, LA*

## JULY 2018

Arapahoe County Fair Homebrew Competition,  
133 entries

*Mark Pennick, Denver, CO*

## SEPTEMBER 2018

NSW Amateur Brewing Championship 2018,  
434 entries

*Brett McKenna, New South Wales, Australia*

## OCTOBER 2018

SFBC Funks Homebrew Competition,  
100 entries

*Christopher Potts, Ashton, ON*

Winnipeg Brew Bombers Pro/Am Brew Challenge, 466 entries

*Alex Cochran, Vancouver, BC*

Concurso de Cervejas Uniso, 15 entries

*Jorge Amaral Filho, Sorocaba, Brazil*

8th Warsaw Homebeer Competition 2018 / Warszawski KPD 2018, 362 entries

*Marek Kawecki, Podlaskie, Poland*

NCLAC ARToberfest Judge's Choice Award for Best Homebrew, 13 entries

*Johnny Griffith, Longview, TX*

Ozarks Open, 52 entries

*Lee Mahony, Odenton, MD*

Dixie Cup XXXV, 809 entries

*David Rogers, Cypress, TX*

Celebrewtion, 164 entries

*Hirendu Vaishnav, Alamo, CA*

Blue Ridge Brew Off, 365 entries

*Chris Rabeau, Matthews, NC*

Music City Brew Off, 172 entries

*Nathan Short, Memphis, TN*

Dunedin Craft Beer and Food Festival

Homebrew Competition, 111 entries

*Laura Aitken, Dunedin, New Zealand*

Competencia Nacional de Homebrewers Panama

2018, 30 entries

*Alec Ortiz, Panama City, Panama*

Competencia Amateur Cerveza Mexico 2018,

219 entries

*Santiago Pons Cano, Mexico City, Mexico*

Spooky Brew, 158 entries

*Jeff Landers, Hoffman Estates, IL*

Texas Mead Cup, 121 entries

*Thomas Repas, Hermosa, SD*

2ª Oktobier - Concurso de Cerveja Artesanal da Categoria Bancária do Distrito Federal,

20 entries

*Vinicius Ferraz Campos Florentino, Brazil*

2018 Salmonid HBC Grim Reaper Challenge,

52 entries

*Jeff Shearer, Victor, MT*

Singapore Ibrew Challenge, 117 entries

*Kai Hung Koh, Singapore*

SA National Homebrew Champs Finals,

21 entries

*Carel van Heerdern, Cape Town, South Africa*

Homegrown County Craft Home Brewing

Competition, 48 entries

*Gunnar Blohm, Kingston, ON*

Southern New England Regional Homebrew Competition, 361 entries

*Andrew Tipler, Trumbull, CT*

2018 AIChE Beer Brewing Competition (ABBC), 25 entries

*Brewsburgh Team (Pittsburgh AIChE Local Section) - Robert Parker, James Schneider, Michelle Pressly, Pittsburgh, PA*

QUAFF Mead Competition, 1 entry

*Oleg Shpyrko & Matt Barrett*

## NOVEMBER 2018

Brew for a Cause, 9 entries

*Michael and Polly Swenor, Grove City, OH*

Noneco 2018, 66 entries

*Rodrigo Peixoto Campos, Maceió, Brazil*

Brew Oahu Homebrew Competition, 53 entries

*Phillip Lisonbee, Honolulu, HI*

Son of Brewzilla, 450 entries

*Greg Irving, North Royalton, OH*

Hoppy Halloween 21 - The Devil Made Me Brew It!, 612 entries

*Tom Roan & Nancy Bowser, Fargo, ND*

2018 Skirmish in the Triad, 232 entries

*Metts Potter, Greensboro, NC*

MALT Turkey Shoot, 112 entries

*Richard Fawley, Fairfield, PA*

California State Homebrew Competition,

365 entries

*Chris Clark, Tracy, CA*

Nevada State Homebrew Competition,

89 entries

*Jason Wagner, Reno, NV*

Africa Brew 2018, 14 entries

*Christopher Rothman, Bloemfontein, South Africa*

11th Annual Monster Homebrew Competition,

45 entries

*Bradley Brewing, Austin, TX*

Baton Rouge Bicycle Brew Club Homebrew

Competition, 39 entries

*Tre' Haydel, Baton Rouge, LA*

Santa Fe Open Brewing Competition,

125 entries

*Mike Ouке, Pengilly, MN*

*Continued >*

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**DEADLINES  
APPROACHING**

[WWW.LABEERCOMP.COM](http://WWW.LABEERCOMP.COM)

Brew Slam 2018 (GTA Brews), 826 entries  
Chris Potts, Ashton, ON

LIBME's Beer and Mead Competition -  
6th Annual, 200 entries  
Ben Jakowski

9º Concurso Estadual de Cervejeiros ACervA  
Paulista, 57 entries  
Luiz Eduardo Miziara, São Paulo, Brazil

31st Annual Southern California Regional  
Homebrew Competition, 300 entries  
James Cota, Spring Valley, CA

The Blue Ox Brew Off, 47 entries  
Dave Matson, Champlin, MN

Best of Hogtown 2018, 25 entries  
Jim Radtke, Gainesville, FL

VII Concurso Estadual da ACervA Catarinense,  
300 entries  
André Volpi Valim, São Bento do Sul, Brazil

NXNW Slaughter Lane Wort War III, 30 entries  
Robert Chaney, Austin, TX

Copa Cordobesa de Homebrewers, 52 entries  
Jeremias Luchina, Córdoba, Argentina

1º Concurso de Cervejas Caseiras Tio Ruy,  
15 entries  
Eduardo Sodré, Rio de Janeiro, Brazil

Brew Con World Series II, 401 entries  
Rob Gallagher, London, UK

VII Concurso Paranaense de Cerveja Feita em  
Casa, 221 entries  
Ciro Guerios, Curitiba, Brazil

  
**ON THE WEB**  
For an up-to-date calendar  
of AHA and BJCP events,  
visit the Events section of  
[HomebrewersAssociation.org](http://HomebrewersAssociation.org)

1º Concurso de Cervejas Caseiras da ACervA  
Paraibana, 16 entries  
Kleber Kersting Filho, João Pessoa, Brazil

True Brewer, 26 entries  
Mike Hurst, Cambridge, ON

1st Annual Societe du Lambic Sour & Wild Beer  
Competition, 59 entries  
Andy Gamelin

Saskatoon Headhunters Brewing Competition,  
318 entries  
Cory Day, Vancouver, BC

FOAM Cup, 463 entries  
Jeff Landers, Hoffman Estates, IL

Motown Mash, 385 entries  
Paul Odell, Morristown, NJ

WCB Meads, Ciders, Sours, 38 entries  
Jeremy Strong, Perth, Australia

OCMashups vs. BrewCommune Big Beer  
Competition, 50 entries  
Cameron Kurth, Costa Mesa, CA

2º Festival do Cervejeiro Artesanal de Mato  
Grosso do Sul, 70 entries  
Christian Ferreira Bigaton, Campo Grande, Brazil

Moravian Homebrewers Meeting, 121 entries  
Russell Wickwar, Ostrava, Czech Republic

7º Concurso Estadual Acerva Gaúcha,  
120 entries  
Elson José Martins de Sousa Júnior, Caxias do Sul,  
Brazil

Sixth Annual Big Spruce Home Brew Challenge,  
46 entries  
Ian Wheatley, Halifax, NS

QUAFF COC - Old World Strong Ales,  
15 entries  
Adam Keithley

[Continued >](#)



# Sanctioned Competition Program

## - Continued

Copa Cerveza San Arnulfo Invierno,  
20 entries  
Luis Aguilar, Zapopan, Mexico

CHAOS and Lo Rez Club-Only Competition:  
Tropical Stout, 15 entries  
Jon Phillips, Chicago, IL

### DECEMBER 2018

CiderDays Amateur Competition 2018,  
137 entries  
Claude Jolicoeur, Quebec, Canada

4th Annual 50 West/Ocelot Classic, 84 entries  
Joe Darden, Dulles, VA

Northern Regional Winemakers & Brewers  
Association Competition 2018, 113 entries  
Roi Humphris, Helensville, New Zealand

Leandro Lafferriere 6ta Ed Cerveceros  
Santafeinos, 15 entries  
Cesar Foti, Paraná, Entre Ríos

8<sup>a</sup> Copa de Cerveceros Caseros de Chile/ Final  
Campeonato Chilebruers, 83 entries  
Gustavo Lagos, Santiago, Chile

Palmetto State Brewers Open, 278 entries  
Steve Vinson, Ridgeville, SC

7th Beijing Homebrew Challenge, 173 entries  
Pang Lian, Qinhuangdao, China

Pennsylvania Homebrew Open Competition,  
129 entries  
Jeff Preussner, Malden, MA

Hoppy Cup 2018, 57 entries  
Kenneth Man-hin Tsang, Hong Kong, China

Queen of Beer, 71 entries  
Jess Finlay-Schultz, Aurora, CO

Brasseurs Royale, 27 entries  
Andy Scherzinger & James Gould, Cypress, TX

Happy Holidays Homebrew Competition,  
617 entries  
Andy Laidlaw, Golden Eagle, IL

ASH HBOY Kolsch Mini-Comp, 8 entries  
Mike Bush, Chandler, AZ

Northeast Brewers Alliance Homebrew  
Competition, 174 entries  
Timothy Kane, New Brighton, MN

Humpy's Big Fish Homebrew Competition,  
42 entries  
Mike Cragen, Anchorage, AK

Society of Fellows Holiday Homebrewing  
Competition, 14 entries  
Sebastian Rämisch, La Jolla, CA

1<sup>a</sup> Copa Cervejeira das Concervas: Etapa  
Londrina, 54 entries  
Juliana Pimenta, Maringá, Brazil

Piracicaba Beer Cup 2018, 60 entries  
Lucas Faria, Lavras, Brazil

FDR Iron Brewer 2018, 40 entries  
Peter Bergstrom & Terence Tse, San Francisco, CA

HHCBC Last Brewer Standing: Finale, 16 entries  
Kevin McKenna, Wantagh, NY

CRAFT Homebrewer of the Year Competition 3,  
8 entries  
Kory Ketelhut, Shelby Township, MI

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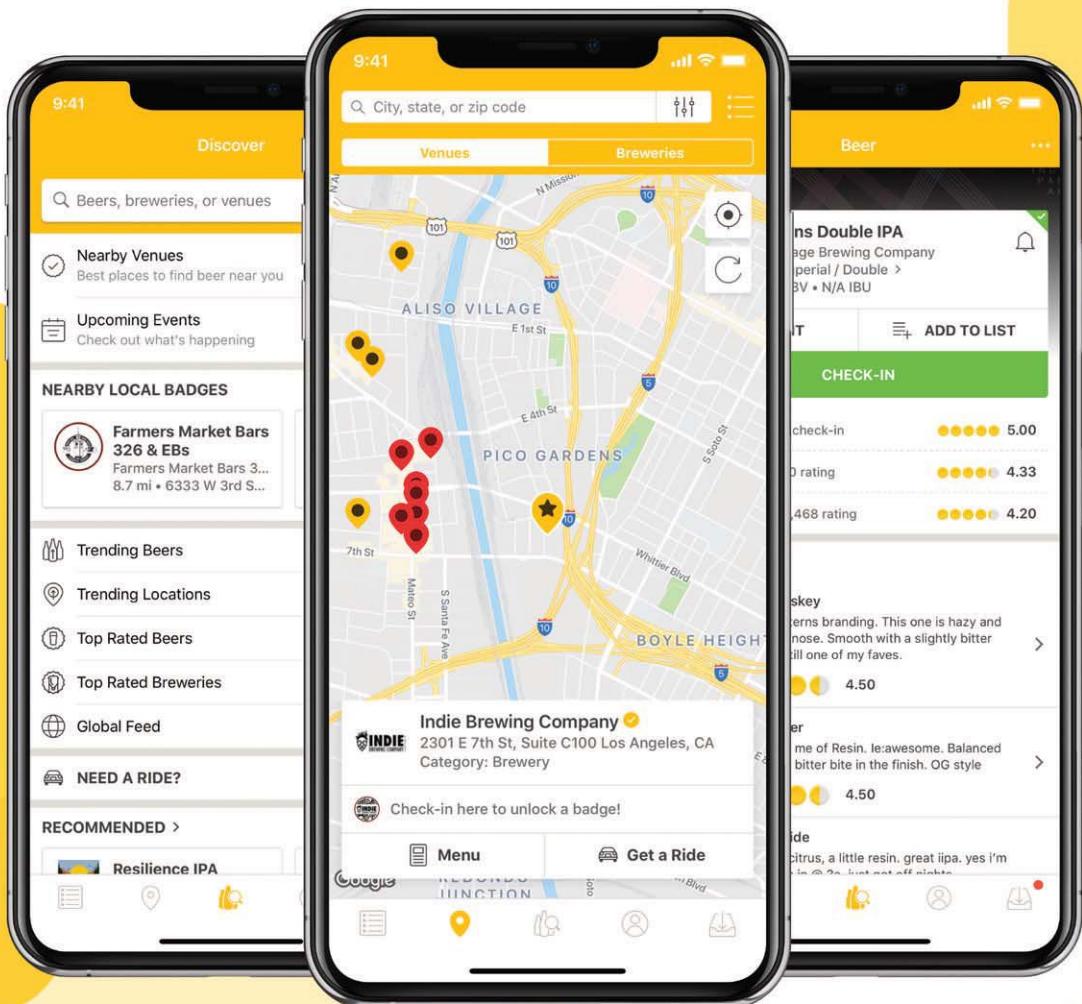
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PA continues its relentless dominance in the craft beer world, winning over seasoned beer enthusiasts and attracting new crowds of beer drinkers who now seek out IPAs exclusively. Much of this fascination stems from homebrewers' and craft brewers' endless creativity as they change the rules and find new ways to celebrate fruity, oily, spicy, coniferous, earthy, and dank aroma hops. One of the newest IPA permutations seems to have taken off like wildfire and, in the last year, has seen widespread acceptance among craft and amateur brewers. →

Pale, highly effervescent, and light-bodied, but packing voluminous hop aromatics and flavor, brut IPAs have a special enzyme called amyloglucosidase to thank for their bone-dry finish (for more on amyloglucosidase, see “Enzymurgy” on page 52 of this issue). This enzyme goes where ordinary alpha and beta amylase do not, converting larger sugars, which ordinarily give beer heft and sweetness, into fully digestible glucose; this additional conversion dries out the finish and amps up the alcohol.

Amyloglucosidase is produced from *Aspergillus niger*, a type of mold in the same family as *Aspergillus oryzae* (*koji*), which is used to brew sake. Mega breweries have actually used this enzyme to create a dry, refreshing finish in small, adjunct-heavy beers. IPA brewers are putting it to similar use on a small scale but are instead using that light, dry body as a canvas for hops.

It seems every small brewery is making a variant of brut IPA these days, but the style is so new that the BJCP has not yet defined style parameters for it. Our stalwart BJCP judges, however, were interested in evaluating a couple of examples—you know, for science. With the help of the guy who started this whole brut IPA phenomenon, Kim Sturdavant of San Francisco’s Social Kitchen and Brewery, Zymurgy’s own Amahl Turczyn sketched out some rough “beta” guidelines and turned our judges loose with some generously donated craft samples.

The first example, Dry Bones Extra IPA, comes from Sturdavant himself, who is on a continuing mission to tweak and evolve the style and keeps a few brut IPAs on constant rotation at his brewery in San Francisco. At 7.2% ABV, Dry Bones is murky yellow with the prominent tropical fruit and orange Citra hop aromatics you’d expect from a good NEIPA, but the palate is indeed bone dry. The second example is Bubblin’ Brut IPA from 4 Noses Brewing in Broomfield, Colo. Complex and dry, with 7.5% ABV, this super-pale IPA has just 20 IBUs but boasts forests of dank, fruity, piney hop character.

*To read the style guidelines our judges referenced to evaluate these samples, check out Ferment on This in this issue of Zymurgy.*

# Judges' Score DRY BONES EXTRA BRUT IPA

Social Kitchen and Brewery, San Francisco, Calif. | BJCP Category 21B Specialty IPA



GORDON STRONG



SANDY COCKERHAM

## AROMA

High hop aroma—citrus, tropical fruit, and pine. Neutral malt, light grain. Clean fermentation profile. Has an impression of dryness. Light yeasty note. Hop-forward balance. **10/12**

## APPEARANCE

Highly effervescent. Medium-sized white head exhibits fair retention. Quite hazy, which makes it look darker. Deep straw color. **2/3**

## FLAVOR

Initial hop character is strong, and is similar to the aroma: citrusy, tropical, and piney. Moderate bitterness reminds me of a pale ale in balance. Dry finish. Fruity, hoppy aftertaste. Full finish despite dryness due to alcohol and carbonation. Clean fermentation character. Neutral grainy malt in background. Fresh. Hops last throughout. Bitterness is clean, not harsh. **17/20**

## MOUTHFEEL

Medium-full body. Very high carbonation. Moderately warming. Feels quite full on the palate due to prickly carbonation. Not astringent. **3/5**

## OVERALL IMPRESSION

A tasty IPA featuring fresh, fruity hops and a delicious flavor. It's dry, but with more body and mouthfeel than expected. Clean fermentation. Fresh. Malt in background. Well-balanced and drinkable for an IPA. It's more bitter than many brut IPAs and actually fairly close to many modern American IPAs. A lighter mouthfeel would improve the beer, as would maybe a touch less bitterness. Great hop character, though. **8/10**

**TOTAL SCORE 40/50**

## AROMA

Medium high hop aroma has passion fruit and tropical fruit aroma plus a light touch of diesel, light herbal and resinous notes. Very low grainy base malt. Fermentation character is neutral. Inviting aroma.

**10/12**

## APPEARANCE

Yellow, straw-colored with medium high haze. The head is thick and mousse-like, finely beaded, with great retention. **3/3**

## FLAVOR

The flavor starts out hop forward. Hop flavor is medium high with tropical fruit—a little dank, resinous, and piney. Scant clean malt character noted. The finish is very dry. Bitterness is a hint above medium intensity and leaves a resinous feeling on the tongue. I perceive sort of a green flavor from the hop oils too. The lingering finish leaves behind orange and grapefruit pithiness. **16/20**

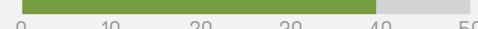
## MOUTHFEEL

Medium body with high carbonation. There is an oily, resinous, pithy dry sensation on the tongue. Moderate alcohol warming. **3/5**

## OVERALL IMPRESSION

This is an interesting beer. Overall, I found it refreshing, but it really wasn't as crisp as I expected for the style. It seemed a little heavy, and the bitterness seemed closer to a traditional American IPA when combined with the way the hop oils, resin, and pine played on my palate. I'd call this beer a highly carbonated hop showcase. **7/10**

**TOTAL SCORE 39/50**



# Judges' Score BUBBLIN' BRUT IPA

4 Noses Brewing Co., Broomfield, Colo. | Category 21B Specialty IPA



DAVE HOUSEMAN



SCOTT BICKHAM

## AROMA

Intense hop aroma features mango and citrus with low fruity fermentation esters. Little malt, alcohol, DMS, or diacetyl aromas. Clean, crisp, balanced, and aromatic. Very inviting. **10/12**

## APPEARANCE

Highly carbonated. Pale gold color. Hazy, but not cloudy. Dense, rocky, white head has very good retention. **3/3**

## FLAVOR

Low supporting malt flavor with a touch of crackery Pils character. Very high hop flavor with the same mango and citrus. Moderate hop bitterness. Not bone dry; leaves a touch of sweetness in the finish. No DMS, diacetyl, or alcohol. Low fruity fermentation esters. Altogether, very well balanced. **17/20**

## MOUTHFEEL

Medium to medium-thin body. Smooth, but not creamy. Lager-like crispness. Very low lingering bitterness. No astringency. Low alcohol warming. **5/5**

## OVERALL IMPRESSION

A crisp, dry ale that is all about the hop flavors and aromas. Very drinkable, especially for IPA enthusiasts who appreciate hop aroma and flavor but shun bitterness. At 7.5% ABV, the alcohol is very deceptive; it's there to prove this is an IPA, but it's subtle and in the background. As a brut IPA, this could be even drier, but the levels of malt and residual sweetness balance the fruity hops very well. An excellent beer to enjoy with salads and appetizers to leave the tongue unassaulted and enjoy the full meal. **8/10**

**TOTAL SCORE 43/50**

## AROMA

Moderate earthy, herbal notes with light background citrus. Slightly cheesy notes suggest hops might have been a little past their prime. Very low bread crumb malt character. Clean fermentation. Very low alcohol. **8/12**

## APPEARANCE

Pale straw color and an evenly textured white head that lasts. Conditioning is excellent. **3/3**

## FLAVOR

Initial low, bready malt. Low pear and red apple esters. Hops are moderately woody and a little spicy, with a hint of citrus rind. Dry, crisp finish like a brut Champagne, with moderate hop bitterness. I pick up a little alcohol at the end, but the balance and emphasis are on the hops. Oxidation is not as noticeable in the flavor. **16/20**

## MOUTHFEEL

Medium-high carbonation with low creaminess due to the dryness. There is some prickle from carbonic acid and moderately low alcohol warmth. Some astringency would be acceptable at lower levels, but it's a little too harsh in this sample. **4/5**

## OVERALL IMPRESSION

This is the best of the five interpretations of brut IPA I have recently tasted in terms of a dry, Champagne-like finish. The crispness nicely accents the bittering hops. I had hoped for fresher American hop character: citrus, pine, and floral notes would have played well with the subdued malt character and dry finish. Nice job, and keep exploring these new styles! **7/10**

**TOTAL SCORE 38/50**

## JUDGING

One way beer judges check their palates is by using commercial "calibration beers"—classic versions of the style they represent. *Zymurgy* has assembled a panel of four judges who have attained the rank of Grand Master in the Beer Judge Certification Program. Each issue, they score two commercial beers (or meads or ciders) using the BJCP scoresheet. We invite you to download your own scoresheets at [bjcp.org](http://bjcp.org), pick up a bottle of each of the beverages and judge along with them in our Commercial Calibration.

## OUR EXPERT PANEL

Includes Dave Houseman, a Grand Master VI level judge and competition director for the BJCP from Chester Springs, Pa.; Sandy Cockerham, a Grand Master IV level judge from Indianapolis, Ind. and an associate exam director and Midwest Representative for the BJCP; Scott Bickham, a Grand Master III judge from Corning, N.Y., who has been exam director or associate exam director for the BJCP since 1995; and Gordon Strong, a Grand Master IX judge, principal author of the BJCP Style Guidelines, and president of the BJCP board who lives in Beavercreek, Ohio.



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## ON THE WEB

Social Kitchen & Brewery  
[socialkitchenandbrewery.com](http://socialkitchenandbrewery.com)

4 Noses Brewing  
[4nosesbrewing.com](http://4nosesbrewing.com)

BJCP Style Guidelines  
[bjcp.org](http://bjcp.org)



Illustrations by Terry McNerney

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# A Style is Born

By Amahl Turczyn  
and Dave Carpenter



**W**hat makes a beer style a beer style? When has an offshoot of a recognized style sufficiently diverged from its parent to warrant separate classification? Groups like the Beer Judge Certification Program (BJCP) and Brewers Association (BA) face these questions every time they release a new set of style guidelines.

Compared to the long history of beer, the concept of styles is still new. The late, great Michael Jackson is rightfully credited with having popularized the idea that beers can be categorized into groups. When he coined the term “beer style” in *The World Guide to Beer* in 1977, homebrewing was still federally illegal in the United States. Thus, a sizable number of today’s homebrewers have come of age in a beer landscape in which styles have always existed.

Some styles are relatively straightforward, especially when one or more commercial

examples serve as defining archetypes. Saison Dupont, Pilsner Urquell, and Paulaner Salvator are by no means the only classic examples of saison, Bohemian Pilsner, and doppelbock, but most of us agree that they are reliable standard bearers for whole classes of beers that have more similarities than differences.

Other styles are more nebulous. If your next homebrew club meeting needs a conversation starter, just ask everyone to write down the difference between porter and stout and see where the evening takes you.

## A SPECIAL IPA, INDEED

When the idea of evaluating brut IPA for this issue’s installment of Commercial Calibration came up, there was plenty of enthusiasm all around. Brut IPA is seemingly everywhere right now, so there was no shortage of examples from which to

choose. But there was a not-terribly-minor sticking point: neither the BJCP nor the BA had developed a style description against which to judge them.

One could certainly judge brut IPA using the standard American IPA description, but to do so would be a disservice and miss the point of the exercise. After all, the BJCP 2015 Style Guidelines place the final gravity for American IPA (Category 21A) between 1.008 and 1.014, and most brut IPA finishes out considerably drier than that.

So, working with Kim Sturdavant and our Commercial Calibration judges, Zymurgy associate editor Amahl Turczyn developed a stylistic description for brut IPA that would allow our judges to evaluate their samples within the framework of Category 21B Specialty IPA. Here’s what the BJCP’s 2015 Style Guidelines have to say about entering that category.

**Entry Instructions:** Entrant must specify a **strength** (session, standard, double); if no strength is specified, standard will be assumed. Entrant must specify specific **type** of Specialty IPA from the library of known types listed in the Style Guidelines, or as amended by the BJCP web site; or the entrant must describe the type of Specialty IPA and its key characteristics in comment form so judges will know what to expect. Entrants may specify specific **hop varieties** used, if entrants feel that judges may not recognize the varietal characteristics of newer hops. **Entrants may specify a combination of defined IPA types (e.g., Black Rye IPA) without providing additional descriptions.** Entrants may use this category for a different strength version of an IPA defined by its own BJCP subcategory (e.g., session-strength American or English IPA)—except where an existing BJCP subcategory already exists for that style (e.g., double [American] IPA).

So, to enter 21B using a non-canonical type, you have to provide your own description. The text goes on to offer three strength classifications:

- Session IPA: 3.0–5.0% ABV
- Standard IPA: 5.0–7.5% ABV
- Double IPA: 7.5–10.0% ABV

That's the BJCP schema into which our brut IPA style description fits. To see what we came up with, check out the Brut IPA Style Description 1.0 in the accompanying sidebar.

## DESCRIPTION, NOT PRESCRIPTION

We've said it before, but it bears repeating: style guidelines provide reference standards against which judges can evaluate competition beer. They are not prescriptions for how to brew. Brew your brut IPAs to suit your own palate and personal preferences. But, if you're considering entering a competition, this is a good starting point.

Our brut IPA style description has not been endorsed by the BJCP or the Brewers Association for competition purposes, but homebrewers who enter AHA/BJCP-sanctioned competitions are welcome to include the AHA's description in the comments section when submitting brut IPAs for competition in Category 21B Specialty IPA.

*Amahl Turczyn and Dave Carpenter are associate editor and editor-in-chief of Zymurgy, respectively.*



### ON THE WEB

Download the AHA's Brut IPA Style Description 1.0 at [HomebrewersAssociation.org/mar19](http://HomebrewersAssociation.org/mar19).

## BRUT IPA STYLE DESCRIPTION 1.0

*Developed by Amahl Turczyn*

**Overall Impression:** A very pale, very dry, highly effervescent variant of American IPA, usually highly hopped with aromatic hops, but with far less actual bitterness.

**Aroma:** Moderate to intense hop aroma featuring one or more characteristics of American or New World hops, including citrus, floral, pine resinous, spicy, tropical fruit, stone fruit, berry, melon, etc. Any American or New World hop character is acceptable; new hop varieties continue to be released and should not constrain this style. Most are heavily hopped after flameout, either during whirlpool, dry-hopped, or both. Some "Champagne" styles may incorporate fruit aromatics from additions of actual fruit in addition to or instead of hop-derived fruit; grapes or grape must may be used in these versions to bridge the gap between sparkling wines and beer. A low to medium-low clean malty-grainy aroma may be found in the background. Sweet, grainy aromatics of corn or rice may be present but are not required, as a moderate to high percentage of adjuncts in the grain bill are often used as a means of increasing attenuation. Some brewers have reported aromas of coconut from high amounts of rice in the grain bill.

**Appearance:** Very pale to light golden in color; those with added fruit may reflect fruit color, but it's usually pale. White to off-white foam may be voluminous due to high carbonation and can have good to moderate retention, depending upon alcohol. Clarity can range from brilliant to moderately hazy from late-hop and dry-hop oils.

**Flavor:** Initial flavor should primarily reflect hop oils or added fruit. Grape, citrus, tropical, and stone fruit flavors are common, while bitterness should be restrained. Low bittering hops will be exaggerated by the very dry finishing gravity as well as carbonic acid, but there should not be an aggressive bitterness as one would taste in a West Coast-style American IPA. Malt flavor is all but absent; caramel or juicy sweetness should not be present, though alcohol may provide a sensation of sweetness. Hop flavors should exhibit dry, sometimes wine-like fruitiness. Low tartness may be present from the presence of real fruit but is not required. Finish is dry to very dry ( $1^{\circ}P$  or less) with low hop bitterness.

**Mouthfeel:** Body should be light to very light and, along with high carbonation (up to 3.5 vol.), should lend a Champagne-like quality. Alcohol may be high, with a sensation of sparkling wine-like volatility, but should not be hot or harsh. Residual malt sweetness or dextrin fullness should be absent.

**Comments:** Amylase enzymes, specifically glucoamylase or amyloglucosidase, are used in the mash and/or fermenter along with highly fermentable wort and often adjuncts like rice and corn to achieve close to 100% attenuation. Clean, high-attenuating yeast strains are preferred, though the style will likely evolve as more brewers experiment with more characterful strains. Bittering hops should be used with restraint since, even though it is an IPA, the low finishing gravities will accentuate hop bitterness; generally at or below about 20 IBUs.

**History:** This is very new subgenre of IPA that has ties to the relatively rare European style bière de Champagne, but is generally attributed to brewer Kim Sturdevant at San Francisco's Social Kitchen and Brewery. He is said to have used amylase enzymes to make his triple IPA more drinkable and wondered what effect they would have on a standard-strength IPA. Some see it as a bone-dry West Coast backlash to the New England IPA and milkshake IPA trends that favor sweet, full-bodied, "juicy" flavors in a heavily late-hopped beer.

**Characteristic Ingredients:** Very pale base malt, sometimes married with rice or corn adjuncts, high carbonation and oil-heavy flavor and aroma hops added post-flameout. Mandarina Bavaria, Hülle Melon, and Nelson Sauvin are popular. Sugar additions to aid attenuation are acceptable but must be kept low to avoid hot or harsh alcohols. Amylase enzymes such as Fermfast Glucoamylase, White Labs Ultra-Ferm, or Amylo 300 are used to produce a bone-dry finish, which is further amplified by high carbonation. Crystal or dextrin malts, lactose, or any ingredients that will thicken or sweeten the beer, or prevent complete attenuation, are not to style.

**Style Comparison:** Hopped in a similar fashion to New England IPA, but without sweetness. Pale, sometimes slightly hazy like a West Coast IPA, but without high bitterness. Highly carbonated like a Belgian Golden Strong ale, but even drier, and without Belgian spice and phenol character.

### Vital Statistics:

IBUs: 15–25	OG: 1.060–1.080	ABV: 5.5–12%
SRM: 5–15	FG: 0.990–1.004	

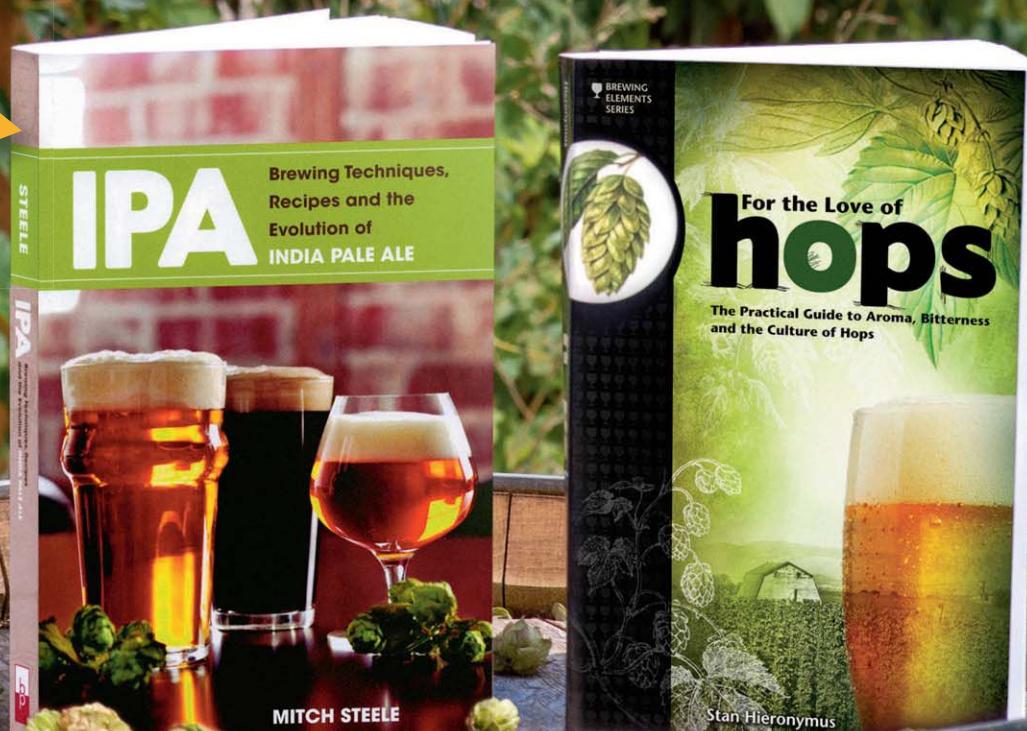
**Commercial Examples:** Bear Republic Brut Squad IPA, Blackstack Bottomless Brut, WeldWerks Chardonnay Brut, Matchless Fancy Stuff Brut IPA, Barrel Brothers Champaderade Brut IPA, Three Weavers Postcolonial Friendship, Dangerous Man Brut Bellini, Four Quarters Paddle On

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# Joseph Taylor, Waterloo Brewer

I am a professional land surveyor and homebrewer in Waterloo, Iowa. When I paid a visit to the local abstract company for a project I was working on, an old map of Waterloo hanging on the wall in the lobby caught my attention.

The map was dated 1874. On each side of the map were panels advertising local products and services. One panel advertised "J. Taylor Brewer of Taylor's Cream Ale." I was curious to learn more.

A friend of mine who worked for our local newspaper, the *Waterloo-Cedar Falls Courier*, sent me a copy of Mr. Taylor's obituary from the March 26, 1890, edition of the newspaper. According to the *Courier*, Taylor was born in Somersetshire, England, in 1827. He came to America when he was 14 years old and eventually settled in Waterloo in 1855 when he was 27. In 1856, he married Anne Ede, who was from Chicago.

Little seems to be known about his brewing business, but the obituary indicated a major turning point for Taylor in 1877:

January 22nd, 1877, he was converted in meetings held in the First Baptist church and shortly after united with the church. ... At the time of his conversion he was engaged in the manufacture of ale. This had been his business for life and was paying him well at the time. He believed the business was inconsistent with a Christian [sic] profession, and after his conversion immediately closed his brewery at a great sacrifice, not attempting to sell his machinery or stock on hand. At that time he quit drinking and ever since has been earnest and active temperance man.

This successful brewer and businessman converted to Christianity at the age of 50 and promptly closed his brewery and stopped drinking. Some may ridicule



him for that, but I admire his conviction. The obituary also had this to say:

He had been sick but eight days and it was only during the last three days that his case was considered critical, being a man of strong constitution and good health, the news of his death was a sudden shock to his friends and fellow citizens, who but a few days before had seen him about the streets and few of whom had heard of his sickness.

We are thus called upon to chronicle the death of another of Waterloo's old and well known citizens. One by one the early residents of our city are passing away.

I love this style of writing—I call it American Shakespeare. I turned to the local



historical society for more information, but the search turned up nothing. Our homebrew club serves at several local beer events that benefit charities, and I have taken to displaying a copy of Mr. Taylor's obituary. I hope someone who sees the name will know a distant relative or have knowledge of the family.

I am still searching for Taylor's recipe for cream ale. The chances of finding it are slim to none, but I am not closing that door. You never know.

**David Scheil** is a professional land surveyor and homebrewer. He brewed his first beer in 1988, and he is currently president of the Cedar River Association of Zymurgy Enthusiasts (CRAZE) homebrew club. He and his wife joyfully reside in Cedar Falls, Iowa.

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