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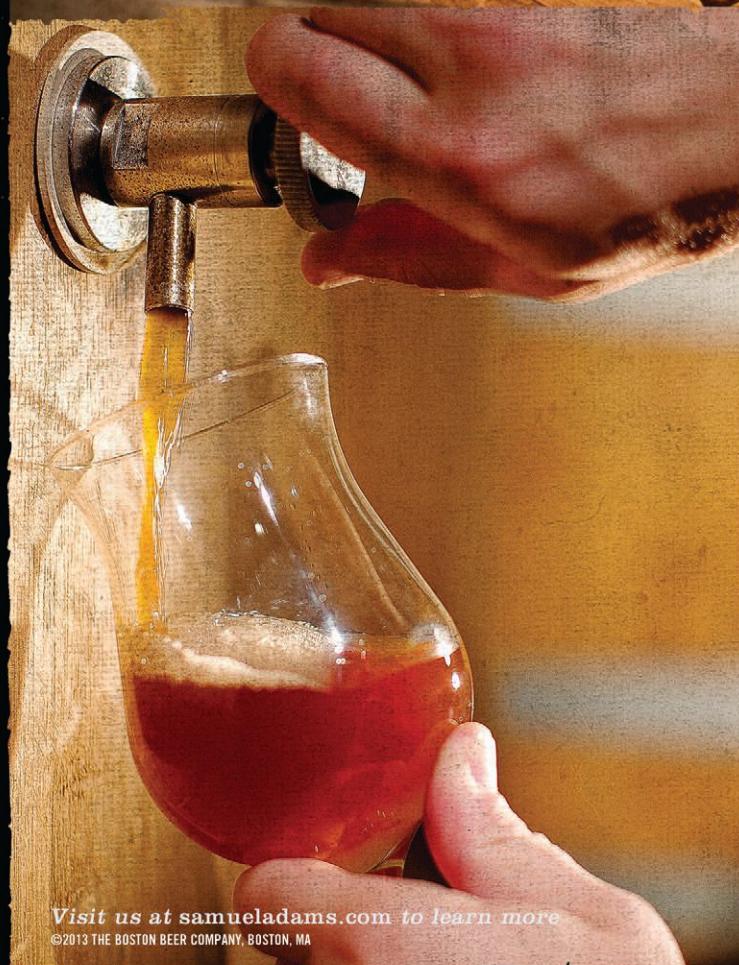
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# The Spice of Life

One of the fun things about the American craft brewing and homebrewing scene is experiencing the brewer's interpretation of a variety of styles. Experimentation with fruit, spices, and unusual ingredients seems to be the rule these days rather than the exception.

Many beer styles provide an open canvas for the brewer's art. Take saison, for example. At the Big Beers, Belgians and Barleywines Festival in January in Vail, Colo., a panel of professional brewers explored this enigmatic style with the standing-room-only attendees.

"How many of you like saisons?" asked panel moderator David Edgar in starting off the session. Pretty much every hand in the room went up.

"How many of you understand saisons?" asked Edgar. Almost no hands went up on this one.

If there's one thing for certain about this particular style, it seems to be that there's not a consensus on what it's supposed to be. Jason Yester of Trinity Brewing Co. in Colorado Springs pointed out that the Brewers Association style guidelines contain a lot of "may or may not be evident..." language in the section on saison. In part, the guidelines read, "Complex alcohols, herbs, spices, low Brettanomyces character and even clove and smoke-like phenolics may or may not be evident in the overall balanced beer. Herb and/or spice flavors, including black pepper-like notes, may or may not be evident."

"I don't think there's a real grasp, especially by American brewers, of what a saison is," said Yester, who suggested that saison should be considered a "beer family" rather than a beer style.

Yester prefers his saisons to be dry, light in body, and spicy/peppery. He said he

uses grains of paradise in almost every saison he creates, but "you don't want to dominate the beer with spices." Yester prefers Styrian Goldings hops for their spicy character. He has experimented with a wide variety of additions, including Buddha's Hand fruit, squash, and cucumbers. Yester served a saison brewed with 700 pounds of hand-peeled cucumbers.

Mystic Brewery in Chelsea, Mass. is focused largely on the saison style. Mystic's Bryan Greenhagen emphasizes the use of local ingredients in his saisons, including incorporating the local cranberry harvest and capturing wild yeast. One house strain was harvested from organic plums found at a farmers market. "Strains can come from all over the place," said Greenhagen.

Dann Paquette of Pretty Things Beer & Ale Project in Cambridge, Mass. brews one saison that is the brewery's core flagship beer (Jack D'or, described as a "saison Americain") as well as a seasonal saison. Paquette said that bitterness is the backbone of his saison (he uses American hops in Jack D'or) and he doesn't add spices or citrus. He suggests using two or three yeast strains since "there's not one saison yeast that will do everything you want it to."

The final panelist, Belgian-born Steven Pauwels of Boulevard Brewing in Kansas City, also uses American hops in Tank 7 Farmhouse Ale, which is dry-hopped with Amarillo. In addition, Tank 7 is brewed with the addition of flaked corn. "Belgian brewers use adjuncts," said Pauwels.

As you can see, as we present our annual "Brewing Outside the Box" issue, spices, fruit, vegetables, wild yeast strains, American hops, and adjuncts may or may not be evident. It's up to the brewer to decide.

**Jill Redding is editor-in-chief of Zymurgy.**



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*By J. Wilson*

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What is it about certain beers that improve with time? In this article, we'll explore what makes a beer more suited to aging and how to brew a vintage beer.

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## >> GET THERE!

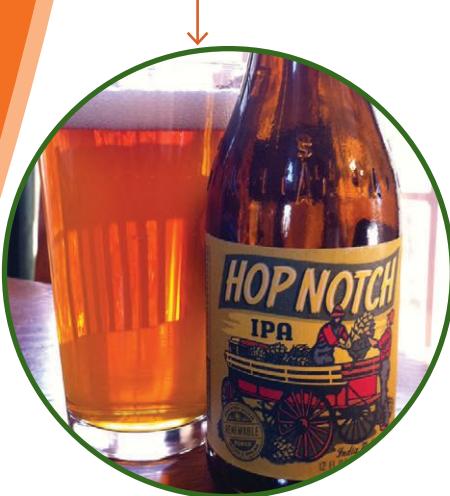
### SWEETWATER 420 FEST

The SweetWater 420 Fest is relocating to Centennial Olympic Park for its 10th anniversary in 2014. One of Atlanta's most celebrated Earth Day events will be commemorating 10 years of festivities April 18-20.

The event was conceived in 2004 at the brewery as a small celebration, eventually blossoming into a full-blown festival featuring a dynamic mix of live music, comedy, art, food, green workshops, a nonprofit village, children's activities, and of course SweetWater Brewing's lip-smackin' lineup of brews.

"We have nothing but love and gratitude for the folks at Candler Park for being such incredible hosts to our festival over the years; however we're very excited to now call Centennial Olympic Park home," said Freddy Bensch, founder and Big Kahuna at SweetWater Brewing Company. "Approaching our 10-year anniversary, we wanted to look long-term for opportunities that will help grow the festival, bring on bigger entertainment and provide better access for local patrons and those traveling in for the fest. This change allows all of that, plus a bigger footprint right in the heart of downtown Atlanta."

The festival drew nearly 60,000 beer lovers in 2013 from Atlanta and across the Southeast. Visit [www.sweetwater420fest.com](http://www.sweetwater420fest.com) for details.



## >> YOU'VE GOTTA DRINK THIS

### UINTA HOP NOTCH

Aggressively hopped IPA with a great malt backbone to follow up. Notes of grapefruit, slightly sweet citrus, and pine. Finishes crisp and dry but no pucker factor. This is a classic West Coast style from Utah and, at 7.3 percent ABV, has a good kick in the pants without being noticeable. Go Utah!

**Reviewed by Steve Comeau, Denver, Colo.**

If you've had a beer you just have to tell the world about, send your description, in 150 words or fewer, to [zymurgy@brewersassociation.org](mailto:zymurgy@brewersassociation.org).



## >> BREW NEWS



It's time once again for *Zymurgy*'s Best Commercial Beers in America Survey!

As homebrewers and beer lovers, *Zymurgy* readers have the most educated and adventurous palates on the planet. So for the 12th year, we are asking you, "Who brews the best commercial beers in the land?"

Just go to [www.homebrewersassociation.org/magazine/best-beers](http://www.homebrewersassociation.org/magazine/best-beers) and type in your favorite

beers. You will need to have your AHA membership number handy. You can vote for both domestic and imported beers, but they have to be available for purchase in the United States. Voting ends March 14. We will tabulate the results and present them, along with clone recipes for some of the top beers, in the July/August issue of *Zymurgy*.

While you're voting, please take a minute to review one of your top beers, in 150 words or fewer, and include that in a "Comments" field (this is appreciated but not mandatory.) We'll include some of your comments in the July/August issue as well as in the "You've Gotta Drink This" in future installments of Beeroscope.

Thanks for voting!

## >> BEER TRAVEL

### ARDENNES TRAPPIST CHALLENGE

Fresh off of another successful touring season, Beercycling.com has announced expanded offerings for 2014. This will be their fourth year providing beer- and cycling-themed tours in Belgium and the Netherlands. In addition to their extremely popular guided tours of northern Belgium (Flanders) and western Holland, the growing company is now offering excursions into French-speaking southern Belgium (Wallonia). The highlight and theme of these adventurous eight-day tours will be cycling to historic Trappist monasteries.

"For many beer connoisseurs, Trappist beer is considered the Holy Grail," says Henk Wesseling, local European tour guide with Beercycling. "Cycling straight to the source where the monks perform their beer-making magic will be on par with taking a religious pilgrimage, just with a tad more drinking," he jokingly adds.

The tour will cater toward advanced cyclists as riders will be exploring the hilly Ardennes Forest. For their physical efforts they will be rewarded with outstanding scenic vistas and samplings of the finest beer in the world. In addition to experiencing the Trappist monasteries producing the legendary Rochefort, Chimay, and Orval ales, riders will also get to visit Fantome, La Chouffe, Interpol, Brasserie de Bastogne, Brasserie Bouillon, and Cantillon along the route.

Included in trip costs are a local guide, B&B-style accommodations, daily breakfast/lunch, and use of a Beercycling assist van that will transport luggage and meals. The initial Ardennes Trappist Challenge events will run from July 18-25 and July 26-August 2. For more information on this and other tours offered, go to [www.beercycling.com](http://www.beercycling.com).

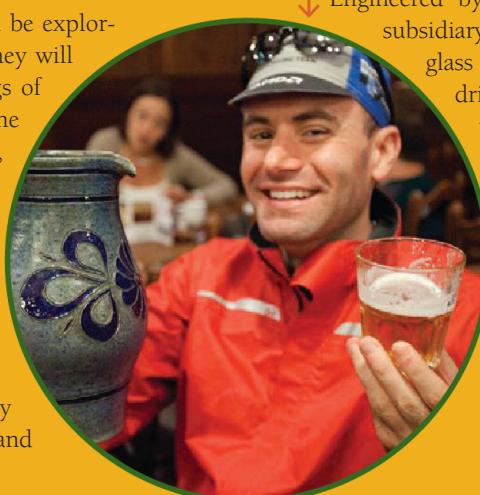
## >> GREAT PRODUCT

### TEKU BEER GLASS



Teo Musso, founder of Baladin Brewery in Torino, Italy, collaborated with Italian sensory analyst Lorenzo Dabone, better known by the nickname Kuaska, to create the TeKu beer glass. Musso recognized the complex role that size and shape play in capturing the essential flavor notes and aromatics of a fine beer, and in reaction to the growing number of brand-specific and variety-specific glasses, his goal in creating the TeKu was to develop an industry standard glass that could be used for the complete range of craft beers. The outward-curving rim allows optimal development of a beer's unique aromas.

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A gift box set of two glasses is available at [www.historycompany.com](http://www.historycompany.com) for a suggested retail price of \$36.

## >> PRO BREWER PROFILE: KONA'S KYLE MURPHY

BY GORDON STRONG



Last summer while my family and I were vacationing in Hawaii, I tried an excellent American amber ale while dining at a restaurant. Lavaman Red was rich and caramel-y while delivering a great punch of hops. I had asked the waitress to give me a local beer if they had any, so I was thrilled to see it was from Kona Brewing Company, a later stop on my trip.

Days later when we made it to the Kailua-Kona brewpub, I first ordered a Paradise IPA while perusing the beer list. The beer was super clean, bitter but not harsh, with a huge tropical

fruit character. It was perfectly named and basically exactly what I like in an IPA right now. I then proceeded to work my way through samplers of their entire lineup, all 17 of them.

Several members of the Kona Coast Barley Boys homebrew club stopped by the table that night to chat, making me feel very welcome. Apparently, it's a popular local stop. Shawn Crawford had invited me to speak at their monthly meeting, so I got to meet some of them early. I appreciated their hospitality; several of the club members brought me local meads and fruits to sample. Mahalo!

At the club meeting the next night, I was introduced to Kona's brewer, Kyle Murphy. He said he had recognized me the night before but didn't stop by the table; instead, he was pumping our waitress for information. "What's he trying? What's he saying?" She apparently said, "He's trying all of them!"

Kyle told me that the Paradise IPA I liked so much owed its character to Galaxy and Citra hops, two of my personal favorites. He said, "We chose to tone down the malt to accentuate the citrus and tropical fruit notes from the blend of hops." A clean fermentation character and smooth bitterness also help showcase the hops perfectly. Speaking of hops, Kyle says his favorite variety is Centennial since it's so versatile ("anytime I have a chance to brew with it, I love it").

After much pleading with the brewery, I was able to get them to share the parent recipe for that beer, Pacifier IPA (so named to honor a number of employees who were having babies). Kyle assures me that Paradise IPA is very similar to this recipe, as they continue to tweak it. I wonder what it would taste like if it used nothing but Galaxy and Citra hops, or if

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Malt Type:  
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Grain Origin:  
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Wort Color:  
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Protein:  
8.0-10.0%

Moisture:  
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Extract (dry):  
82.0% min.

Diastatic Power:  
80-90 °Lintner

Usage:  
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## Pacifier IPA (inspiration for Paradise IPA)

RECIPE PROVIDED BY KONA BREWING COMPANY  
[www.konabrewingco.com](http://www.konabrewingco.com)

### INGREDIENTS

for 5 U.S. gallons (19 L), 72% efficiency

<b>11.0 lb</b>	(5 kg) US two-row malt
<b>6.0 oz</b>	(170 g) US Crystal 80° L
<b>6.0 oz</b>	(170 g) US Carapils malt
<b>0.3 oz</b>	(8.5 g) Warrior pellets, 15.5% a.a. (90 min)
<b>0.25 oz</b>	(7 g) Columbus pellets, 15.5% a.a. (90 min)
<b>0.75 oz</b>	(21 g) Galaxy pellets, 13% a.a. (30 min)
<b>1.25 oz</b>	(35 g) Galaxy pellets, 13% a.a. (steep 7 min)
<b>0.75 oz</b>	(21 g) Citra pellets, 13.4% a.a. (steep 7 min)
<b>2.5 oz</b>	(71 g) Citra pellets, 13.4% a.a. (dry hop)
Wyeast 1056 or WLP001 or Fermentis US-05	

**Original Gravity:** 1.061

**Final Gravity:** 1.013

**ABV:** 6.4%

**IBU:** 65

**SRM:** 7

### DIRECTIONS

Mash at 152 °F (67 °C). Collect 6.5 gallons (25 L), boil 90 minutes. Final volume 5 gallons (19 L). Ferment at 68 °F (20 °C).

**Extract version:** Substitute 7.7 lb (3.5 kg) light liquid malt extract for the two-row. Steep remaining grains for 30 minutes in 158° F (70° C) water, drain, and remove. Add extract, bring to a boil, and follow main recipe.

it also used Kyle's beloved Centennials. I think both of those would be interesting variations.

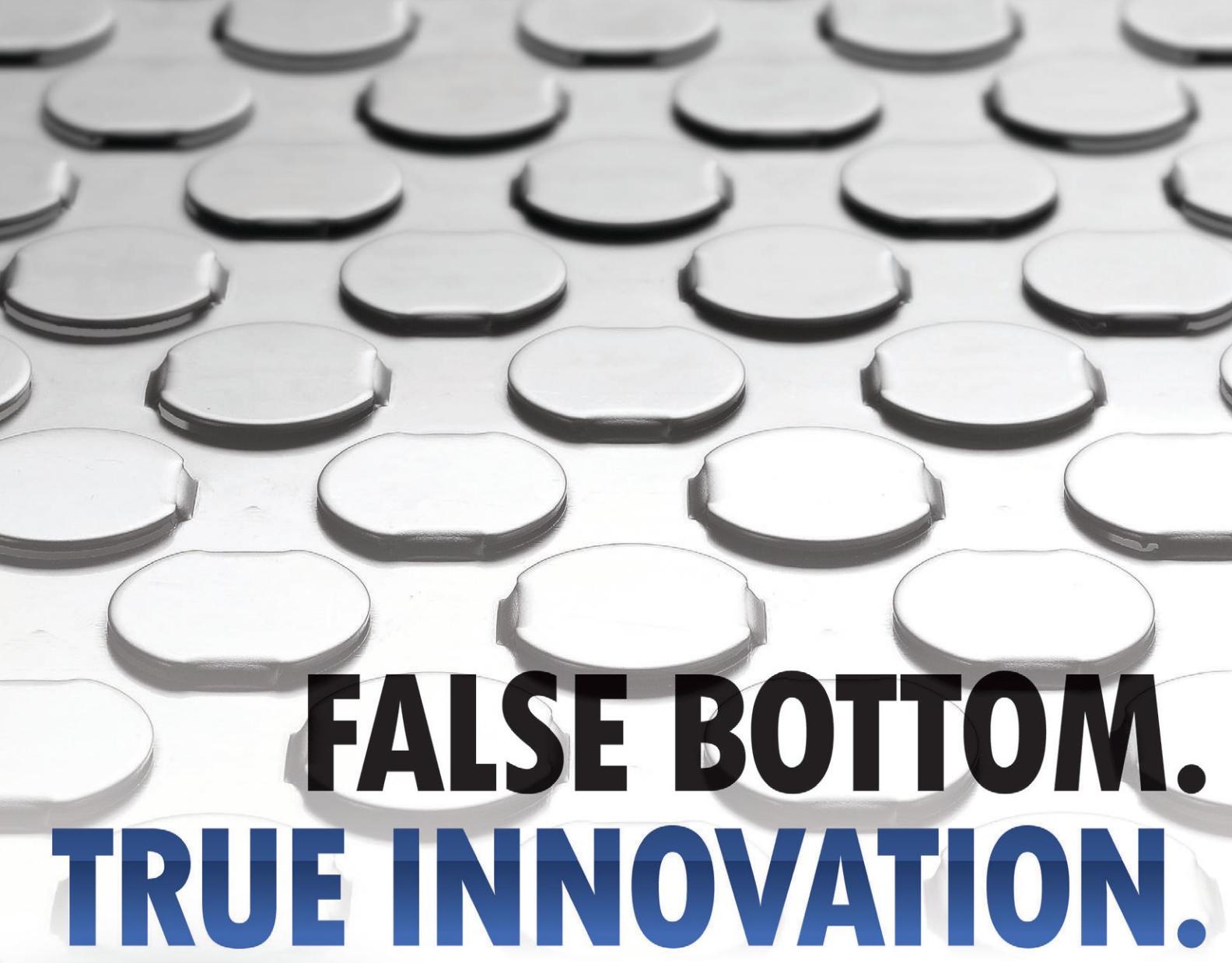
I was also very impressed with their Pipeline Porter (I tweeted that it was perhaps the best coffee beer I've ever tried). Kyle said that it owes its flavor to fresh, local Kona coffee, sourced from a neighboring farm. Sure, but it also took a tasty porter to pair with those smooth coffee flavors. Even their flagship Longboard Lager was full of character, impressive for a mainstream beer; I was expecting an American lager, but it tasted like a proper Munich helles.

Kyle is originally from the West Coast, but moved to Hawaii on a whim after vacationing there. He got a job striping asphalt, but unlucky for them, their headquarters was right next to the brewery. After smelling hops all day, he jumped at the first brewery job opening he saw, starting out as a keg washer before eventually moving up to brewer.

A homebrewer at heart, Kyle still spends time with the KCBB club, helping educate members on the latest trends he learns at brewing conferences. That homebrewer creativity has helped him formulate some of Kona's most popular beers, including the Lemongrass Ginger Luau, first made with lemongrass from Kyle's yard.

I was struck by Kona's pub lineup; it had variety and breadth, but also creativity—several beers featured local ingredients. Cask beers, several IPAs, and a very impressive pub food menu in a laid-back island theme bar made the whole experience memorable. And it wasn't just me that was impressed; my wife insisted that we make one more stop there for a final pint on the way to the airport. My choice? The Paradise IPA, of course.

**Three-time Ninkasi winner Gordon Strong is president of the Beer Judge Certification Program and author of Brewing Better Beer.**



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By Gary Glass



# AHA Governing Committee Election

**B**allots are now being accepted from AHA members for the 2014 AHA Governing Committee election. I urge all AHA members to participate by casting a ballot online at HomebrewersAssociation.org. The Governing Committee and its various subcommittees make the decisions that determine the course for the organization's future. Thus the members

of the Governing Committee play a critical role for your association.

This year's election is particularly important, as eight of 15—more than 50 percent—of the seats on the Governing Committee are up for grabs. With so many contested seats, there are also a record 25 candidates vying for those seats. It is inspiring that so many AHA members are now seeking to participate on the Governing Committee! It is also very important that AHA members take time to read all of the candidate statements and cast votes for the candidates that best represent what you want to see in the future of the AHA.

Candidate statements and ballots can be found on HomebrewersAssociation.org under the Membership section and linked from the Governing Committee pages. Ballots must be completed by March 31. Thank you for voting!



Photo © American Homebrewers Association

## Radegast Club of the Year Award

The deadline for submitting your club's entry for the Radegast Club of the Year Award is quickly approaching. Entries must be submitted via the online form on HomebrewersAssociation.org by March 31.

This new award, named after the Slavic god of hospitality credited with inventing beer (fits nicely with other awards such as the Ninkasi Award and Gambrinus Club Award), was originally conceived as the "Awesome Club of Awesomeness" award. That pretty much sums up what we are looking for: what makes homebrew clubs awesome.

We want to know what your club does to promote the hobby, educate your members, support your community, and have fun. See the Clubs section under Community on HomebrewersAssociation.org to learn more details and submit an entry on behalf of your club. You can upload documents, PowerPoint presentations, videos, or whatever you have to support your submission.

The first Radegast Club of the Year Award will be announced at the 2014 National Homebrewers Conference in Grand Rapids, Mich.

Many thanks to AHA Governing Committee member Drew Beechum for coming up with the concept for the award and taking the ball and running with it.

## We're Moving

After nearly three decades at 736 Pearl Street in Boulder, the Brewers Association (the not-for-profit parent organization of the AHA) is moving to a new location that

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American Homebrewers Association®

## 2014 Governing Committee Election

Your AHA Governing Committee representatives play a critical role in your Association. The AHA Governing Committee develops AHA benefits and programs, and provides direction for the organization.

**Please cast your vote today!**

[HomebrewersAssociation.org/vote](http://HomebrewersAssociation.org/vote)

### Candidates

Please read candidate statements at [HomebrewersAssociation.org](http://HomebrewersAssociation.org) and cast your ballot online. For the 2014 election, there are 25 candidates running for eight open seats on the Governing Committee.

**Mark Job**  
**Daniel Fick**  
**Shane Mull**  
**Roxanne Westendorf**  
**Jonathan Fuller**  
**Tom Roan**  
**Kim Wood**  
**Adam Brenneis**  
**Susan Ruud**

**Sandy Cockerham**  
**Lorena Evans**  
**Craig Hendry**  
**Jennifer Helber**  
**Martin Brungard**  
**Bob Kauffman**  
**Jeff Rankert**  
**Bruce Buerger**  
**Drew Beechum**

**Aimee Richard**  
**Tom Schmidlin**  
**Michael Sardina**  
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**Michael Fry**  
**Steve Cook**  
**Colin Persby**

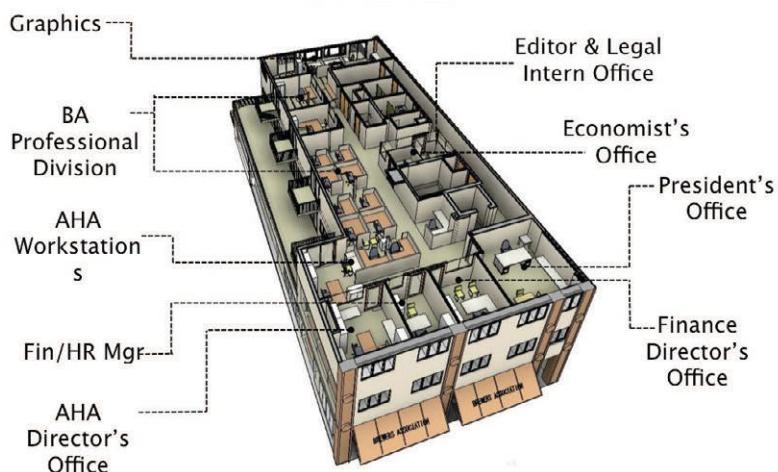
### Election Guidelines

**Balloting is done online.**

Go to [HomebrewersAssociation.org](http://HomebrewersAssociation.org), read the candidate statements, and cast your vote. Vote for up to eight (8) candidates. You will need to include your name, member number and contact information. If you do not know your member number, would like to become a member or cannot vote online, call us toll free at 888-822-6273 or email [info@brewersassociation.org](mailto:info@brewersassociation.org).

All ballots must be submitted before midnight Pacific time, March 31, 2014.

All AHA members voting in the election are eligible for an additional entry in the Lallemand Scholarship drawing for Siebel Institute's two-week Concise Course. Check the appropriate box on the ballot to submit your entry into the drawing. The drawing will take place June 14, 2014 at the AHA National Homebrewers Conference in Grand Rapids, Mich.



will give the association more room to grow. Our new digs at 1327 Spruce Street will be just seven blocks away from the current location.

Over the past few years, the Brewers Association (BA) staff has grown quite a bit to keep up with the rise in both commercial and amateur craft brewing. Since 2010, the BA grew from 32 full-time employees to 48 now in 2014 (in that same time, the AHA grew from 3.5 full-time employees to our current staff of 6.25 full-time employees). Over that same period of time, AHA membership has grown by 80 percent. Our staff has been working in very tight quarters, affecting productivity and morale.

In 2013, the BA board of directors instructed Brewers Association COO Bob Pease to find a solution. After an extensive search for much-needed new space,

the BA, with board approval, purchased a building in downtown Boulder. The purchase is expected to close at the beginning of April, with staff moving to the new space in the summer.

As we transition to the new space, mailed communications can continue to be sent to the Brewers Association at PO Box 1679, Boulder, CO 80306.

Until next time, happy homebrewing!

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

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by Our Readers

# Spent Grains, Chickens, and Eggs



Dear Zymurgy,  
I appreciated the article "Practical Tips for Sustainable Homebrewing" (November/December 2013). I try to incorporate environmental sustainability into my daily life and work, and my homebrewery is no exception.

Brewing uses an enormous amount of resources. I've heard that commercial breweries use an average of 8 gallons of water for every gallon of beer produced; those exceptional breweries mentioned in your article are probably about twice as efficient. As a homebrewer, I've found it difficult to get anywhere near 4:1. Even though I am conservative with my water use and reuse in most stages of my process, I still have to do a lot of cleaning without the efficiencies of scale of a pro brewery. Still, I've found that the methods described by the author certainly help.

I'd like to contribute one more idea to those presented by the author. One of my favorite things about my process is my use of spent grain. I've made dog treats, bread,

who raises chickens. A couple years ago I posted an ad on Craigslist for free spent grains and had several inquiries within minutes. One was from a woman in my (urban) neighborhood who raises chickens, and she's been taking my grains ever since. On brew day I send her a note to let her know that grains are ready, and she swings by to scoop them up, often leaving me with farm-fresh eggs in return. It's a win-win-win (if you count the chickens).

Keep up the great work!

Chris Jensen  
Denver, Colo.

## More Cider Details

Dear Zymurgy,  
I read the Cider Yeast Comparison article (November/December 2013) with great interest, as I have been informally testing

### FROM OUR READERS

A homebrew label from Zymurgy reader Bob Rhoades.



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various yeasts for years. It is interesting to see that two of the yeasts produced a reportedly sweet-tasting cider; however, there was no supporting data (final gravity or Brix). I'm left wondering if the yeast really did leave sugar behind, which would be surprising to me, or if there was a flavor perception of sweetness, which I have experienced with some yeasts, even though the cider was actually dry.

Any chance we could see OG, FG, and perhaps pH and titratable acidity values for each of the ciders?

Thanks,  
Tim Bray  
Albion, Calif.

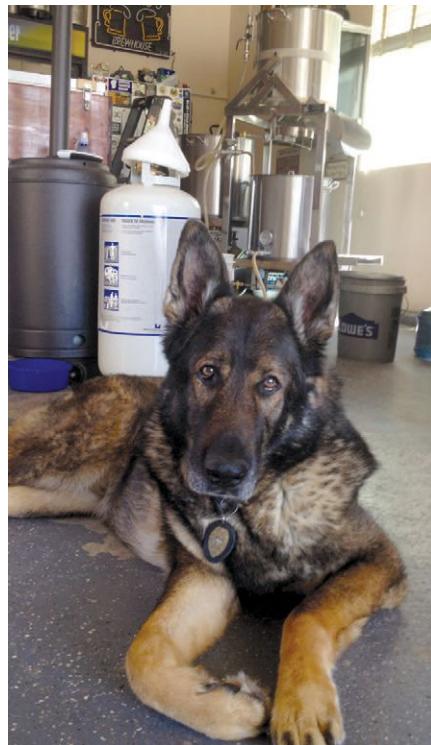
*Article author Stan Sisson replies: Thanks for your interest in the cider yeast comparison. The project was an informal effort to see what differences using several yeast strains would produce in a finished cider, where the only difference was the strain selected and fermentation temperature (keeping ferm temp in the recommended range for each strain). The project was already underway*

*when the AHA Research and Education Fund (REF) was announced, and we did not know there would be an article associated with the experiment.*

*With seven different cider makers involved, and the informal nature of the project, some details that would have proved useful down the line were not recorded. These included FG and pH, which would have been nice to have in retrospect. OGs were all the same, since we all used the same juice.*

*I understand what you are saying about perception of sweetness versus actual residual sugar, which would have been reflected in the FG values. Alas, all the ciders are long gone, so our best bet would be to do another comparison and record more information. This might be fun to do in the near future, as there were many more strains I would like to try.*

*There has been increasing interest in ciders here in San Diego over the last couple of years. If you ever have the opportunity to visit San Diego, the local homebrew community would be happy to share the results of our efforts with you.*



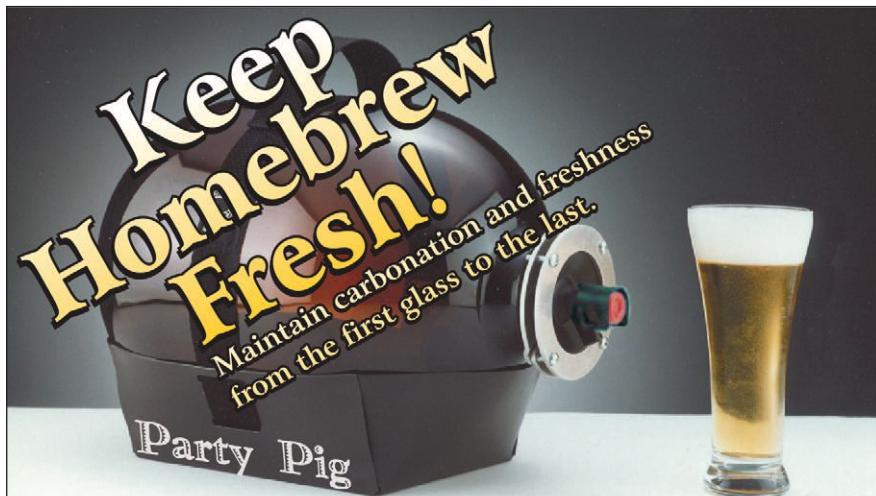
### Brew Dog Tribute

Dear Zymurgy,  
I've always been able to relate to your brew dog photos and had to send this in.

I've been homebrewing since 1999 and had great company for every brew day since 2002 when I was issued Andy. Andy went to work with me for years until his retirement, when he became a full-time brew dog. He was just happy to hang out, clean up spilt grain, and catch a scratch or two by friends stopping by. He was always near when the kettles were ablaze. This picture was taken on his last brew day because, unfortunately, brew dogs don't last forever. At the age of 13, he went to the brewery in the sky. He will be missed and brew days will be a little lonely for a while.

Cheers,  
Jason Ledford  
Greenbelt Brewers Association

**Send your Dear Zymurgy letters to [zymurgy@brewersassociation.org](mailto:zymurgy@brewersassociation.org). Letters may be edited for length and/or clarity. Hey homebrewers! If you have a homebrew label that you would like to see in our magazine, send it to art director Allison Seymour at [allison@brewersassociation.org](mailto:allison@brewersassociation.org).** ☺



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by Professor Surfeit



# Low-Effort Lager?



Dear Professor,  
On a very popular homebrew forum there is a very popular thread about a very popular recipe for a very popular beer style drawn from a very popular book by the very popular Charlie Papazian.

This recipe imitates a certain “triple-hopped” macro brew with ale yeast by using amylase enzyme in the secondary to render a dry, crisp beer that is very, very similar to (some say indistinguishable from) an American light lager.

My two questions about this are as follows:

1. Would it be unethical to enter such a concoction as a Light Lager in a homebrew competition if no lager yeast is used but the finished product fits in the category?

2. Could amylase enzyme be used to imitate other forms of crisp lager (Pilsner perhaps)?

Lazily lustng for low-effort lager,  
John Wilks  
Midland, Texas

Dear John,

If the competition does not clearly require that an entry in a category be made with specific ingredients, yeast, process, etc., then entering a beer that you think tastes exactly like a light American lager but is brewed with an ale yeast seems fair and not unethical.

But if the competition guidelines clearly state that lagers MUST be brewed with lager yeast and/or must be aged a certain amount of time at cold temperatures and must not use enzymes, etc., then that would be clearly unethical.

If the competition guidelines are absent of any style-governing information, it should be reasonable to assume it's allowed.

Personally, I would not judge an American light lager exclusively on its crispness and dryness. There are a lot of other things that go into making this kind of beer taste as good

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as it can be—which I admit is not much, but, hey, give it credit for what it is.

Lacking luster,  
The Professor, Hb.D.

### Pharaoh Ale

Dear Professor,

I am interested in brewing Horst Dornbusch's Pharaoh Ale (March/April 2013 Online Extra, available at [HomebrewersAssociation.org](http://HomebrewersAssociation.org)), but I wanted to get feedback on excluding mandrake. If I exclude the mandrake, will I need to substitute with hops or possibly rue herb for an approximate IBU of 20 from a 90-minute boil? If you recommend hops, what kind? (I was considering Crystal or Saaz hops for their spicy character.) I would greatly appreciate any guidance you could provide.

Respectfully,  
Mark Wilson, ZeusMaster

All Hail the ZeusMaster,  
I entangled Horst into this response: I would not use Saaz or the like as a substitute for mandrake. The flavor this ingredient contributed I subjectively perceived as marzipan (almond and rosewater), but very faint and mild. I would search conventional hop catalogs and look for the "melon" descriptor. Off the top of my head what comes to mind are the Australian Summer (about 6 percent alpha acid), if you can get it, or the new German hop Huell Melon (about 7 percent alpha acid), which is also hard to find for now. But there may be other varieties. If you do a Google search for "hops melon" you should get plenty of suggestions.

BTW, the flavor of this beer was unique, but totally pleasant; it was a very refreshing quaffing beer and it disappeared out of the brewpub serving tank in no time at all.

Thanks Horst,  
The Professor, Hb.D.

### Seeking Clarity

Dear Professor,

I'm very new to homebrewing, but I highly enjoy it. When I ferment a batch, I start in the primary fermenter (6-gallon glass carboy) for seven to 10 days. Then

I rack to a secondary fermenter (5-gallon glass carboy) for another seven to 10 days. Finally, I rack into the bottling bucket to add priming sugar and bottle.

The beer is not as clear as I would like it to be. I would like to add a fining agent to the secondary fermenter, but I'm not sure if I would get the carbonation I would like to have after bottling. Would I be all right with that or is there something different I should do?

Thank you,  
Doug Eppley

Dear Doug E,  
It will carbonate. Often, when beer begins to carbonate under pressure in the bottle, the suspended matter falls out more quickly.

A simple answer,  
The Professor, Hb.D.

### **Stevia versus Sugar**

Dear Professor,

Do you have any experience or advice in incorporating the Stevia plant, whole leaf, powder, or extract in replacing corn sugar during the bottling and/or brewing process? Since Stevia is known to have a licorice and slightly bitter aftertaste, I was wondering if this would lend itself as an ingredient for experimentation in the brewing process. If so, what would the conversion rate be since it is 300 times sweeter than sugar?

Thank you,  
Craig Heath, Charlottesville Area Masters of Real Ale (CAMRA)

Hello Craig,  
Stevia does not ferment, so it would not provide any carbonation. Stevia provides the perception of sweetness. It plays with your brain and tongue. Experiment with the quantity in a pitcher of beer, then ramp up times 10 for a 5-gallon (19 L) batch.

Deceptively sweet,  
The Professor, Hb.D.

### **A Real Scorcher**

Dear Professor,

I recently purchased a great stainless steel brew pot. In my excitement to move from

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extract brewing in my kitchen to a full-wort boil (partial mash brewing) using a propane burner, I made the mistake of putting the grain bag in the 170° F (77° C) water on the burner. The heat was off at the time and doing fine, until the temp dropped and I added heat (much as I would have done in the kitchen), just a little and slowly. But as I was swirling the grain bag in the water, the grains began to slip out—it was obvious that the bag and some grains had scorched to the bottom.

I assumed there was no way to save the wort, so I dumped it. But it's a beautiful (expensive) pot and I would like to save it. I've soaked it and scrubbed at it for two days now and the burned spot is almost gone. At this point can it be used?

Thanks for the guidance,  
Bill Bartman

Dear Bill,  
Yes, you can use it. Even if it had been a coated pot, if you haven't scrubbed away the coating, you can use it.

Thank goodness for steel wool or stainless steel wool scrubbers. You could also try soaking in dishwasher detergent or PBW available at homebrew shops.

Burning down the house,  
The Professor, Hb.D.

**Hey homebrewers! If you have a brewing-related question for Professor Surfeit, e-mail [professor@brewersassociation.org](mailto:professor@brewersassociation.org).**

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By Amahl Turczyn Scheppach

# Style Spotlight: Kellerbier

**D**uring my travels in Germany, there were several outstanding beers; the absolute best was probably Andechs Doppelbock. But the sheer variety of beer styles in that mecca of brewing was staggering, and one beer I will never forget made me think I was back in jolly old England.

It was at the Mahrs Brewery in Bamberg, served cool rather than cold, from a wooden barrel on the bar. It was low in carbonation, a hazy orange color, abundantly and beautifully hopped, and drank more like British real ale than any other beer I'd sampled in Germany. That beer was Franconian "U" (ungespundet, spund

meaning "bung") Kellerbier, a rustic, ancient version of a rather broad group of unfiltered "cellar beers."

As a style, Kellerbier is a bit hard to pin down, since versions vary greatly from region to region. BJCP president Gordon Strong has in the past received many requests to include Kellerbier in the organization's style guidelines, but nailing down a consistent set of parameters that define the beer has so far frustrated the effort. For this Style Spotlight, I will be focusing on a particular type of Franconian Kellertbier, produced in and around the city of Bamberg, and will be

treating it as a style. However, even within Bamberg city limits, two Kellerbiers produced by breweries next door to each other can be very different.

Outside Franconia, the term "Keller" is somewhat loosely applied to other lager beers that bear only a passing resemblance to the fresh, rustic, unfiltered lager I sampled: Keller Pils, Keller Hell, and other "Kellerized" styles are not at all uncommon. But let's zero in on Bamberg's U (pronounced "ooh.")

Barrel-aged, barrel-served Franconian Kellerbier is very much a local beer,



Photo © Michael König neuBIERig

An advertisement for Love2brew Homebrew Supply. The central image is a hand holding a large, steaming mug of beer, set against a circular background with radiating lines. The word "WAE" is partially visible at the top right. At the bottom left, there's a "FREE SHIPPING OVER \$75" offer with the phone number 1.888.654.5511. The Love2brew logo is prominently displayed in the center, along with the text "HUGE SELECTION LOVE2BREW.COM". There's also a small graphic of a stylized grain stalk with a heart.

and is seldom packaged for export to Auslanders; breweries often proudly serve it from barrels in their own taproom or beer garden. While other varieties of Kellerbier are served *vom fass*, normally carbonated and poured from the tap, the Mahrs U beer was gravity-poured from the cask. Some breweries still age their oak casks of Kellerbier in deep caves before service, as was the practice before the advent of refrigeration. So while the style is usually unfiltered, and somewhat hazy as a result, it is still lagered for at least two months; therefore while it probably has more yeast in solution than filtered lager, it should not be excessively turbid or yeasty, and should have very little “green” lager character. It should have a very fresh hop aroma, a pronounced Munich malt toasty/bready quality, and fall within the *vollbier* range of no more than 5.3 percent ABV. While it is stored in oak barrels, the wood is lined with pitch, so none of the oak tannins or other wood character are extracted into the beer. The malt and hop elements should come together harmoniously for a relatively dry finish, which is particularly important in this beer given its relative lack of carbonation at service.

As with British real ale, cellarmanship plays a big role with these beers. The casks are brought up from the cellars, tapped, and served unrefrigerated, with no CO<sub>2</sub> head pressure; the light residual carbonation and gravity coax the beer from barrel to mug. Any excess pressure is allowed to vent from the *spundloch*. Thus, it is a beer made, aged, and served onsite.

It is worth mentioning that Kellerbier has a couple of offshoot substyles, which are not as strong, and therefore do not need to be lagered as extensively. Zoiglbeer is named after the six-pointed *zoigl* (“sign”) that was hung outside of community breweries in medieval times. This star served as an indication that a new batch of brew was ready to drink, and was an invitation to friends and neighbors to drop by for a few pints. (The Maisel Brewery in Bamberg, now sadly closed after over a century of operation, used the symbol on its Hefeweizen label, and made a wonderful version of Kellerbier.) Zoiglbier is under 5 percent ABV, uses darker malts, giving it a bronze

## Spundloch Kellerbier

### INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

7.0 lb	(3.18 kg) German Pilsner malt (63.6%)
4.0 lb	(1.81 kg) German 20° L Munich malt (36.4%)
2.0 oz	(57 g) Hallertauer pellets, 4% a.a. (60 min)
2.0 oz	(57 g) Hallertauer pellets, 4% a.a. (10 min)
2.0 oz	(57 g) Hallertauer pellets, 4% a.a. (whirlpool 10 min)
2.0 oz	(57 g) Spalt whole hops (dry hop 3 days) optional
	ECY28 Kellerbier lager yeast, White Labs WLP833 German Bock yeast or Wyeast 2487 Hella Bock yeast; 4L starter or 200 mL fresh slurry (400 B cells)

Original Gravity: 1.054

Finishing Gravity: 1.010

Brewhouse Efficiency: 75%

IBUs: 34

SRM: 10-15

ABV: 5.7%

Boil Time: 90 minutes

### DIRECTIONS

If using a decoction mash, dough-in at 122° F (50° C) for 20 minutes. Add enough heat or boiling water to bring the main mash to 144° F (62° C) and hold for 20 minutes. Pull the first decoction of thick mash and boil it for 20 minutes, then add it back to the main mash, stirring to equalize at 155° F (68° C). Hold at this temperature for 30 minutes. Raise temperature to 168° F (76° C) and hold for 15 minutes, and commence sparge.

to orange-amber cast, and is only lagered for three or four weeks. It is also less hoppy than Kellerbier.

Zwickelbier is the other substyle, named after the sampling valve (*zwickel*) on a fermentation tank. It is the lowest in alcohol at around 4 percent ABV, and is served even younger than its two counterparts, only days after cold fermentation is complete; so haze and “green” flavors

If you prefer a step infusion, start with a protein rest at 122° F (50° C) for 20 minutes. Add enough heat or boiling water to bring the mash to 150° F (66° C) and hold for 40 minutes. Mash out at 168° F (76° C) for 15 minutes and commence sparge.

Boil 90 minutes total, making sure break has formed in the kettle before adding your first hop charge at 60 minutes. Add whirlpool hop addition at flameout and let the hops steep for 10 minutes before chilling the wort to either 70° F (21° C) if you are pitching a starter, or 49° F (9° C) if you are repitching slurry. Once activity is visible, ferment one week at 49° F (9° C), then raise to 53° F (12° C) and ferment an additional week (this will allow for diacetyl reduction), or until terminal gravity is reached. Add dry hops during the last three days of this week if you choose. Package, carbonate, and lager 6 to 8 weeks at 35° F (2° C). If kegging, you may wish to force carbonate the beer to a lower, more authentic level of 1.5 volumes; the hop dryness and good attenuation will balance the beer despite less fizz. Some haze may persist past lagering, especially if you dry hop. Serve in a heavy earthenware mug at cellar temperatures of 50-55° F (10-13° C), preferably with friends in your backyard beer garden.

### EXTRACT VERSION

Substitute 8.5 lb (3.86 kg) Munich malt extract syrup for Pilsner and Munich malt. Expect a slightly lighter brew (7.5 SRM) with extract.

and aromas like sulfur, yeast, and even acetaldehyde may be present at low levels. Commercial examples, in fact, may exhibit a host of young beer complexities, not all of them necessarily pleasant: these may include earthy, bitter, fruity (often citrus, but also dried fruit like prunes and raisins), nutty, leathery, caramel/toffee, bready/yeasty, herbal (usually described as grassy or vegetal), woody, and even sour/acetic and lactic/yogurt.

Due to highly kilned malts, the color is usually a burnt orange, with strong, toasted malt aromatics; it's only lightly hopped with Hallertau, and boasts a higher carbonation than the barrel-served "U." Zwickelbier is in fact the perfect lager for impatient homebrewers, but it can take the concept of "brewery-fresh" to an extreme. (Kellerweis, famously produced by Sierra Nevada Brewing Company, is actually an authentic Bavarian wheat ale, and therefore unrelated to Kellerbier save for the nominal resemblance.)

### Brewing Kellerbier

Franconian U Kellerbier is the focus here, however, so let's do a rundown on the ingredients. First, water. Bamberg is one of many German cities famous for its breweries, but oddly enough, the groundwater there isn't the greatest brewing water. It's high in sulfates (241 ppm) and bicarbonates (281 ppm), with 106 ppm calcium, 50 ppm magnesium, 28 ppm sodium, 40 ppm chloride, and a relatively alkaline 8.34 pH. Considering that the malt bill in our Kellerbier recipe isn't acidic enough to neutralize that alkalinity, it is highly recommended that you ignore the water profile above, start with distilled or reverse-osmosis water, and simply add a modest dose of calcium sulfate (gypsum). This sacrifices authenticity somewhat, but gives you the water ions you need while freeing you of the necessity to mitigate those you don't. One-and-a-half grams of gypsum per gallon (8.25 grams total for the recipe) will contribute 92 ppm calcium for mash efficiency, clarity, and yeast health, and 221 ppm sulfate to bring out hop dryness. One could certainly use calcium chloride instead of (or in addition to) gypsum, but the sensation of hop dryness is a key factor in this beer, so I tend to favor calcium sulfate for Kellerbier over the round, sweet, and malty flavors encouraged by its chloride counterpart.

The malt bill for Franconian U Kellerbier is fairly simple: Pilsner and Munich malt. While most amber to dark German lager recipes favor light (7-10 L) Munich malt over dark (20 L), Kellerbier benefits from the deeper color and toastier flavors of the darker version. Try to use Bavarian Pils and Munich malt if possible; I've had good luck with Weyermann® malts.

You want the bready malt depth to really come through mid-palate, so if you have the means and patience to do at least a single decoction mash, you'll get a more authentic color and flavor from the extra malt melanoidins, as well as an improved yield. At the very least, however, you should do a multi-step infusion mash to get the most out of this grain bill: a 20-minute rest at 122° F (50° C), a beta amylase rest at 150° F (66° C) for 40 minutes, and an alpha rest at 168° F (76° C) for 15 minutes. Sparge at 170° F (77°

C) until wort running from the kettle reaches 1.008 (2° P). One could add a few ounces of melanoidin malt to compensate for decoction mashing, though many brewers consider this to be only a partial replacement.

Hops are also simple, especially since there aren't many types to choose from if you want a traditional Kellerbier: German Hallertau is the hop to use. Mittelfruh is said to have a finer, more floral/herbal aroma than the spicier Hersbrucker, but



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either will work just fine. Some versions of this beer are said to use Spalt for late aromatic additions. American-grown Hallertau can be substituted if German-grown is unavailable. Make the best of those noble hop flavors and aromas with an addition 10 minutes before the end of the boil, as well as a 10-minute steep at flameout. The aromatics really come out after about six weeks of proper lagering, and are a hallmark of the style. Some craft breweries in the U.S. have even experimented with dry-hopped Kellerbier. While I've never heard of any Franconian brewers doing this, I've had very good results dry hopping with two ounces of Spalt in the fermenter for a few days prior to lagering, for extra aromatics. The added floral punch is downright intoxicating.

Yeast selection may seem obvious: just go with any Munich or Bavarian lager yeast. However, keep in mind that you will be drinking a relatively fresh, young lager. While Franconian "U" Kellerbier doesn't have the ridiculously fast turnover of the Zwickelbier version, there still may be some lingering remnants of fermentation

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that wouldn't otherwise be present in a fully-aged lager. One obvious benefit of its youth is the extra pop and vibrancy you'll get from the aroma hops, but the downside is that not all of the green lager character may have had a chance to bubble up or fall out. Fortunately, not all Bavarian lager strains produce eye-popping levels of sulfur (like WLP 838 Southern German Lager or Wyeast 2308 Munich Lager can); some even have a pleasantly bready, fruity, earthy profile straight out of the fermenter, and those are the ones you should seek. Ayinger's house strain, for example, cleans up fast, attenuates well, and makes room for both malt complexity and a noble hop expression. It's a wonderfully versatile yeast, and works for all kinds of German lagers, so White Labs WLP 833 German Bock or Wyeast 2487 Hella-Bock lager yeast should definitely be on your shopping list whether you brew a Kellerbier or not. I personally have not tried the ECY28 Kellerbier lager strain, but judging from the name, it should be another top choice for the style.

And if you are really against the whole yeasty/bready thing or experience yeast-related gastric discomfort from young beer, but still want to brew a Kellerbier, you could always break with tradition and fine your keg with gelatin. Use one packet of unflavored supermarket gelatin, add about 60 mL (1/4 cup) of boiled, cooled water, and stir gently to let it absorb the water and become a thick paste. Cover it and let it rest about 15 minutes. Then add 150 mL (2/3 cup) of boiling water and stir gently until the gelatin is dissolved. The temperature should equalize at about 170° F (77° C)—you don't want it much higher. As soon as you begin racking to your keg, pour in the gelatin solution and let it blend evenly as the keg fills. Then lager as usual, and your Kellerbier will drop clean and bright.

**Amahl Turczyn Scheppach is associate editor of *Zymurgy*.**

## Resources

German Beer Institute ([www.germanbeer-institute.com](http://www.germanbeer-institute.com))

Email conversation with Gordon Strong  
Rick Garvin and Bob & Ellie Tupper



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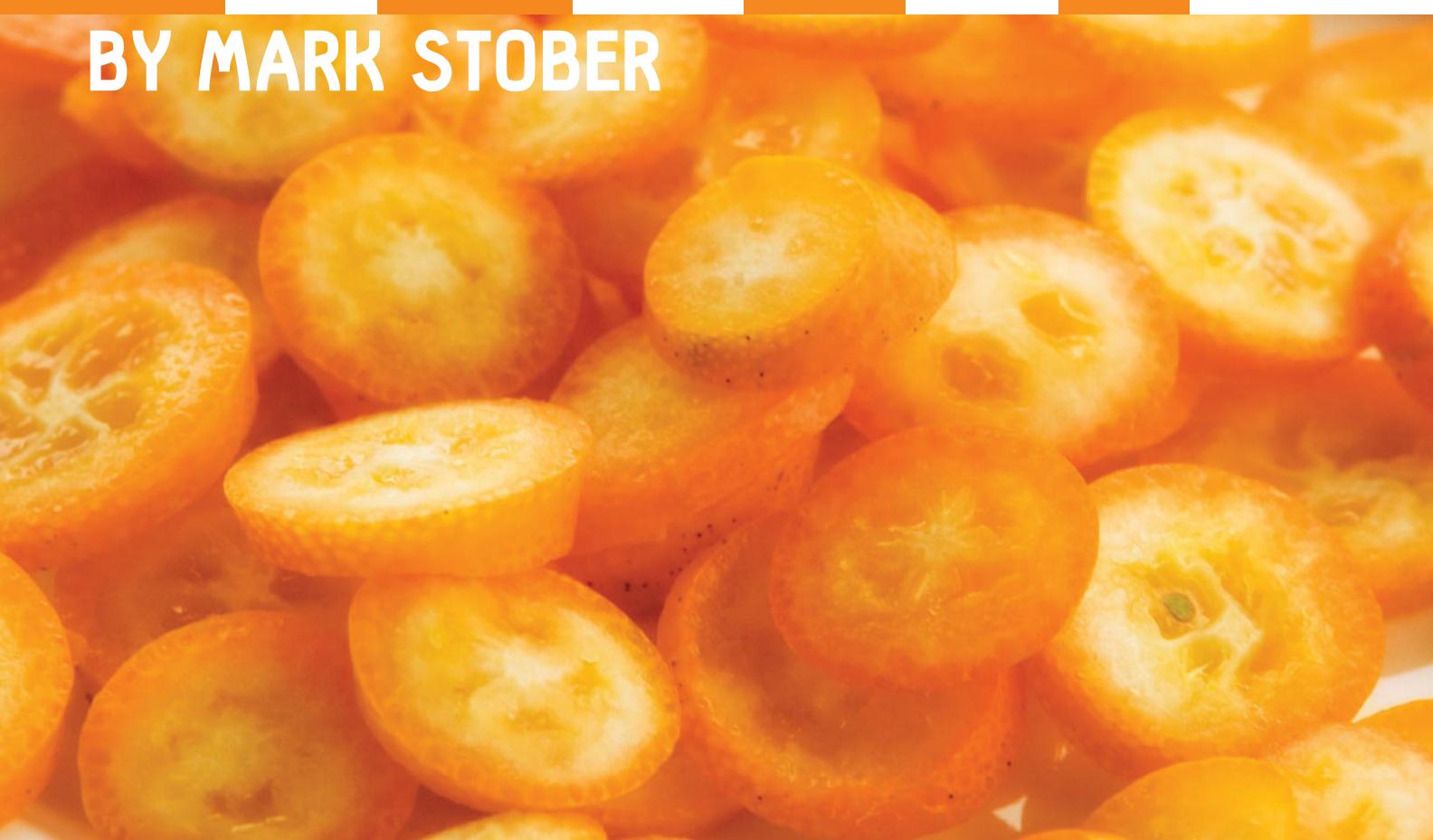
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BRANCHING OUT:  
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# KUMQUATS

BY MARK STOBER





A number of years ago, I moved to a rural area north of Tampa Bay just outside the small town of Dade City, Fla.—home to an annual kumquat festival and the self-proclaimed “kumquat capital of the world.” A few miles down the road, among the few rolling hills in Florida, sits 45 acres of kumquat trees and the nation’s largest commercial kumquat growing operation.

Naturally, a brewer’s curiosity took hold and I set out to explore the use of kumquats in beer. What I discovered is a dynamic fruit that is wonderfully suited for use in a variety of beer styles.

#### QUIRKY FRUIT, FUNNY NAME

Kumquats are a small citrus fruit native to China and long popular in Asian culture. They were first exported to Europe in the mid-1800s and not long thereafter were introduced in America. The Gude family, owners and operators of the commercial grove outside Dade City, have been growing kumquats for generations, the first tree having been planted in the area around 1900.

Kumquats grow in tropical or semi-tropical climates, so commercial production in the United States is primarily limited to Florida and parts of California. The

harvesting season generally runs from November through April.

Brilliant orange in color and slightly bigger than a large grape, these “little gems of the citrus family” have often been prized as much for their appearance as for their taste. In the ‘60s and ‘70s, citrus packers often included a few kumquats and their leaves in gift box shipments sent north in the wintertime, resulting in many a confused consumer who had no idea what they were or how they were eaten.

Kumquats are unique in that they are the only citrus fruit that can be consumed whole with no need to peel the soft, fragrant skin. There is no pith in a kumquat, which is another factor that allows them to be eaten skin and all. The flavor of a kumquat is an interesting blend of sweetness and tartness with each element

contributed from either the flesh or the peel. The fruit is most commonly used in making pies, jams, chutneys, and sauces, but kumquats are enjoying increasing popularity among gourmet chefs and foodies who find many uses for their unique and unusual taste.

Domestic kumquat production is generally limited to two different varieties of fruit: the Nagami and the Meiwa. Nagami kumquats are the dominant variety and most widely available, as their flavors are best suited for cooking and marmalades. Nagamis are oval in shape, and the flesh is tart while the peel is sweet and citrusy. Meiwa kumquats are lesser known but excellent for use in beer and eating whole. The flavor profile of the Meiwa kumquat is in some respects the reverse of the Nagami. It has sweet flesh and a tart, peppery flavor in the peel. Meiwas

# KUMQUAT AMARILLO WHEAT ALE

## INGREDIENTS

for 5 U.S. gallons (19 liters)

3.75 lb	(1.7 kg) pale malt, 41%
4.6 lb	(2.09 kg) malted wheat, 50%
13.0 oz	(367 g) 20° L Munich malt, 9%
Rice hulls as needed for mash	
0.25 oz	(7 g) Amarillo pellet hops (10.6% a.a.) 60 min
0.5 oz	(14 g) Amarillo pellet hops (10.6% a.a.) 15 min
0.75 oz	(21 g) Amarillo pellet hops (10.6% a.a.) 3 min
0.75 oz	(21 g) Amarillo pellet hops (10.6% a.a.) flameout
US05/1056/WLP001 (American Ale) yeast, dried or liquid	
2.0 lb	(0.9 kg) whole kumquats (about 48), preferably Meiwa variety, in secondary

Brewhouse Efficiency: 75%

Original Gravity: 1.052 (12.4 °P)

Final Gravity: 1.010 (2.5 °P)

IBU: 21

SRM: 5

ABV: 5.6%

## DIRECTIONS

Single infusion mash for one hour at 152° F (67° C). Primary ferment 7-10 days at 68° F (20° C). After primary, rack into kegs or carboys for secondary conditioning with the fruit. Add 24 kumquats into either keg or secondary. Prepare kumquats by slicing in half length-wise and removing seeds. Allow 7-10 days conditioning with fruit prior to either serving or racking from secondary into bottles/kegs.

Extract Version: Substitute 3 lb (1.36 kg) pale malt extract syrup for pale malt, 3 lb 10 oz (1.64 kg) wheat malt extract syrup for wheat malt and 10 oz (283 g) amber malt extract syrup for Munich malt. Drain, rinse grains, dissolve extract completely, and proceed with recipe.



are also more rounded in shape than the oval Nagami.

## BREWING WITH KUMQUATS

For the brewer, it is essential to taste the fruit whole to experience the different flavors offered in each variety, as well as to understand the flavor elements pulled from both peel and flesh. Because of the various contrasts, a brewer has abundant opportunities to fine-tune the specific flavors desired in the beer by experimenting with the variety or combination of varieties used, as well as in the preparation of the fruit (by removing or exposing peel or flesh).

As an added bonus for the brewer, the peel of the kumquat contains significant levels of humulene and murolene. These compounds contribute to spicy, bitter, and woody notes and flavors. If those descriptors sound familiar, it's with good reason, as these same compounds are also found in hops, particularly the citrusy American strains like Amarillo and Citra. As a result, using kumquats in beers that feature these hop strains offers a complementary flavor profile, and one that is quite different than most other fruits would impart in a beer.

Kumquats are available in whole or pureed form, with whole fruit being the preferred method for use in beer due to the ability to control the ratio of flesh and peel. Additionally, whole kumquats can be frozen for preservation and later use. Care must be taken, however, to ensure that frozen fruit is added either still frozen or carefully thawed, as once thawing begins the fruit will release juice and oils altered by the freezing process. The interior of the fruit contains two to five greenish seeds. When possible the seeds should be removed prior to use, as they contain pectin, which could contribute to clarity issues.

As with other fruits, a number of different methods can be used to introduce kumquats into beer. Because much of the flavor profile comes from the essential oils in the skin, it is recommended that the fruit be added post-boil to avoid driving off the volatile compounds contained in those oils. I have typically added the

prepared whole fruit directly into a corny keg in a fashion similar to dry hopping. If a secondary fermentation is used, the fruit could be added in that step prior to bottling or kegging. An added benefit to use in secondary would be the ability to rack the beer off the fruit once the desired flavor profile is reached.

Whole fruit can be prepared for use in the beer in several different ways depending on whether the flavors from the peel

or the flesh are to be emphasized. Slicing in half length-wise and removing the seeds will allow equal exposure to both flesh and peel. If desired, the ends of the fruit can be sliced off to reduce the amount of peel and increase exposure to flesh. Alternately, the fruit can be sliced in half width-wise to decrease exposure to flesh and increase peel, and if the ends are cut off, the flesh can be pushed out completely, leaving nothing but a ring of peel.

## KUMQUAT KÖLSCH

RECIPE BY MIKE LOGSDON

### INGREDIENTS

for 5 U.S. gallons (19 liters)

8.25 lb	(3.75 kg) Durst continental Pilsner malt (2 °L) or similar
8.0 oz	(227 g) Weyermann® Vienna malt (4° L)
1.75 oz (49 g)	Hallertau pellet hops (4% a.a.) 60 min
2.0 lb	(0.9 kg) fresh kumquat puree, secondary
White Labs WLP029 (German Ale/Kölsch) or Wyeast 2565 (Kölsch) yeast	

Brewhouse Efficiency: 75%

Original Gravity: 1.048 (11.9 °P)

Final Gravity: 1.009 (2.3 °P)

IBU: 25

SRM: 4

ABV: 5.1%



### DIRECTIONS

Mash at 149° F (65° C) for one hour or until enzymatic conversion is complete. Boil 90 minutes, adding hops 30 minutes into the boil. Ferment at 66° F (19° C) until primary is complete then transfer to secondary and lager at 34° F (1° C) for two weeks. Add kumquats and lager an additional two weeks before bottling or kegging.

**Extract Version:** Substitute 6.75 lb (3.06 kg) Pilsner malt extract syrup for Pils and Vienna malts. Drain, rinse grains, dissolve extract completely, and proceed with recipe.

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## FINDING AN AUDIENCE

A variety of base beer styles fit well with kumquats. Wit beers that feature orange peel as a flavor contributor are a natural for the pithless kumquat, although with this style the brewer may want to emphasize the sweeter aspects of the fruit and minimize the tart and bitter. Belgian beers that feature fruity overtones in their yeast profile such as saison and Belgian blonde are also a good fit, although care must be taken with already fruity beers to not turn them into "fruit bombs." American pale ales and IPAs that feature citrusy hop profiles also blend very well with kumquats, particularly the Meiwa variety that has a spicy, peppery finish in the peel similar to hops.

A number of Tampa Bay area brewers have successfully incorporated kumquats into their beers with both commercial and amateur success. Dade City's spring 2013 kumquat festival saw around 40,000 attendees. A recipe contest is held in conjunction with the festival that typically features food and dessert recipes utilizing kumquats. Tampa homebrewer Mike Logsdon shook things up a bit last year by entering the first-ever beer into the recipe competition, a kumquat Kölsch, and it ended up winning the best of show award for the entire contest as judged by a panel of local chefs and celebrities. Mike graciously submitted his recipe for this article.

A recent trend among craft brewers in Florida has seen the emergence of a sub-style of Berliner weisse with tropical fruits added to enhance the crisp-tart character of the beer. Some folks have begun referring to this sub-style as "Florida weisse," and a popular version of it was brewed by Cigar City Brewing in 2013 employing kumquats. The limited release Dos Años Kumquat Berliner Weisse was brewed as a classic Berliner with kumquats added to the secondary and won a gold medal in the 2013 Best Florida Beer championships.

**Mark Stober is a founding member of Tampa Bay BEERS homebrewing club, a BJCP Master judge, and longtime AHA member. He has been an avid homebrewer for over 20 years.**

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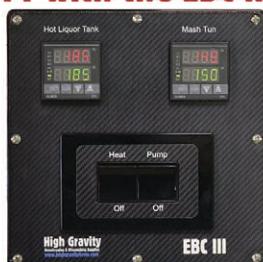


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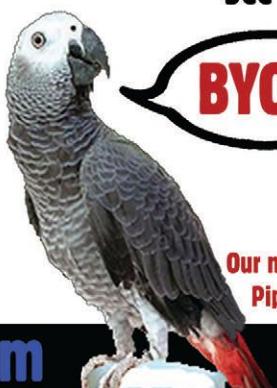
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# A *Zest* for Experimentation: Brewing with Citrus

By Tony Hansen





The first time I brewed with citrus was early in my professional brewing career. At that point, I had little experience, but plenty of ideas and blind ambition. The brew was Nicie Spicie, our American wheat ale at Short's Brewing Co., which incorporates a blend of four types of peppercorns, coriander, plus orange and lemon zest. To prepare the ingredients, I hand zested the lemons and oranges for six hours, followed by an hour of hand-grinding peppercorns and coriander. After I'd completed that task, the beer had nearly finished fermenting, and I was ready to add the zest and peppercorns into the primary fermenter.

This particular tank had a flip-top manway with plenty of space to add special ingredients directly into the tank post-fermentation. I poured my buckets of zest into the tank with no indication of the volcano that was about to erupt. As I began dumping my bucket of ground spices into the tank, the fine dust of the grind started blowing back into my face, followed by a rush of foam, CO<sub>2</sub>, and bits of zest and spices. In a moment of adrenaline and timely deftness, I managed to get the manway closed before losing all of the zest and spice additions I had painstakingly prepared.

While, fortunately, the beer turned out great, I've since learned that it takes more than good intentions to effectively incorporate citrus into your beer.

#### PRACTICAL TIPS

Since that first experience, I've brewed more than a dozen different beers at Short's that include citrus. Consumer demand and our own experimental curiosity have driven the creation of a cornucopia of citrus beers at Short's in the past couple years. While each of these beers naturally employs distinct brewing

techniques, there are a handful of considerations I've found to be relevant to all citrus beers.

Timing isn't everything, but it's a big thing. When the objective of a citrus addition is primarily to add aroma, we make the addition on the cold side (to finished beer). In these late stages, the timing of the addition works out approximately the same as it does with dry hopping—the purpose is to focus on enhancing aromatics more than flavor components like bitterness or acidity.



# Pretty Nicie, Pretty Spicie

## Wheat Ale with Spices and Citrus

Recipe provided by Short's Brewing Co.

### INGREDIENTS

FOR 5 U.S. GALLONS (19 L)

6.0 lb	(2.72 kg) 2-row pale malt
6.0 lb	(2.72 kg) wheat malt
rice hulls as needed for mash	
1.0 oz	(28 g) Fuggle pellets (60 min)
0.5 oz	(14 g) Fuggle pellets (30 min)
0.5 oz	(14 g) Fuggle pellets (steep)
4.0 oz	(113 g) ground coriander seed (steep)
1.0 oz	(28 g) ground white peppercorn (steep)
1.0 oz	(28 g) ground green peppercorn (steep)
1.0 oz	(28 g) ground pink peppercorn (steep)
1.0 oz	(28 g) ground black peppercorn (steep)
2.0 oz	(57 g) fresh orange zest (in secondary)
2.0 oz	(57 g) fresh lemon zest (in secondary)
American ale yeast (13.5 million cells/mL)	

Original Gravity: 1.055 (13.5 P)

Final Gravity: 1.008 (2 P)

ABV: 5.75%

IBU: 14

### DIRECTIONS:

Perform a single infusion mash with a mash temperature of 153° F (67° C). Rest mash one hour, then sparge with water temperature of 170° F (77° C). In 60 minute boil, pitch 1 ounce Fuggle hops immediately at the start of the boil, 0.5 ounce hops at 30 minutes, and 0.5 ounce hops, coriander, white peppercorn, green peppercorn, pink peppercorn, and black peppercorn as soon as flame is kicked off. Cool wort to a primary fermentation temperature of 68° F (20° C). (If using a heat exchanger, do not add the peppercorns at flame out. Heat the peppercorns separately with hot wort in a separate vessel to sterilize then add to already cooled wort.) Transfer beer from primary fermentation vessel to secondary. "Dry hop" with orange and lemon zest at 72° F (22° C) for five days before packaging. When packaging, do not filter.

### EXTRACT VERSION:

Substitute 4.44 lb (2 kg) pale malt extract syrup for the pale malt and 4.44 lb (2 kg) wheat malt extract for the wheat malt. Dissolve completely and proceed with the boil.

When the objective is to capture the crisp, tart flavor of fermented citrus, we add the citrus in the early stages of primary fermentation. While the "dry hop" aromatic citrus additions are usually in the form of zest or peel, early-fermentation flavor additions are generally puree or juice. As for timing, my opening Nicie Spicie story clearly suggests that attention to gravity and awareness of dissolved CO<sub>2</sub> should never be overlooked.

We've experimented with all forms of citrus (zest, dried peel, juice, and puree) and quantities of citrus additions vary, as every recipe is different. However, I have found that when using fresh zest, a minimum of 1/4 pound per barrel (1 ounce per 7.75 gallons, or about 1 gram per liter) is needed to reach what I consider a sufficient amount for my taste. On the other hand, 1/4 pound of dried peel (containing pith) per barrel is the maximum amount I would recommend using in order to avoid harsh bitterness. You can choose your own adventure with puree and juice, depending on the intensity of flavor you're looking for.

While all of these can be effective in certain recipes for additional flavor components, we have noticed that using zest can act as a sort of clarifying agent in beer. The zest provides a greater surface area for yeast or other particles like dry hop material to stick to and settle out in the fermenters. For beers like The Liberator (double American IPA with orange and lemon zest), this greatly improves the quality of the beer in two ways. It not only adds awesome citrus oils to mellow the extreme bitterness and expand the beer's aroma, but also makes it clear very quickly.

Finally, and this is perhaps an obvious consideration, it is absolutely vital to add citrus in an aseptic manner in order to prevent spoilage bacteria from contaminating the beer. While I've read that some of the first beers in history to be made with fruit may have been made that way to cover up off-flavors, we are using it to complement a clean base style—therefore it's imperative that we're not introducing contamination in our process. Whether you choose to brew with zest, peel, juice, or concentrate, all can (and should) be

purchased as aseptic products. Here at Short's, we no longer hand zest fresh fruit, instead purchasing aseptically packed zest. If you do use fresh fruit, we recommend soaking the whole fruit in a no-rinse sanitizer before zesting it.



## BREWING TECHNIQUES

To give a better sense of how these techniques are actually incorporated in the process (and hopefully to inspire your own creativity in exploring citrus as a brewing ingredient), I've broken down some of our beers with citrus into categories of objective.

### Using Citrus to Enhance Hop Profiles

Citrus fruits as adjuncts in hoppy beers are enticing because of the variety of terpenes contained in their oils. Even if you didn't know them by name, you've come across terpenes before in brewing as your favorite aromatic hydrocarbon in hop resin. By pairing a citrus fruit with that hop character, you get all the distinct profiles of both with added complexity in their interactions. It quickly becomes one of those "greater than the sum of its parts" situations.

We have added citrus to a number of hop-forward beers, most notably in The Liberator. This double IPA has an enormous amount of American hops added throughout the boil, which would have an extremely overpowering bitter finish if it weren't for the addition of orange and lemon zest. The zest is added post fermentation with the dry hops to obtain maximum citrus aroma and to add fruitiness. This also tricks the brain into perceiving

the bitterness of the citrus more than the bitterness of the hops, though the two have a balancing effect.

Other examples of beers in our portfolio that use this approach are Hopstache (an American IPA using grapefruit zest to enhance its citrusy hop profile), Anniversary Ale (a heavily dry hopped wheat wine in which blood orange puree and orange zest boost the qualities of Simcoe), and Beard of Zeus (an India pale lager benefiting from an addition of dried orange peel).

### Using Citrus to Refresh

When approaching the process of designing a summertime beer, a primary objective for many is to offer a refreshing quaff. Introducing citrus can achieve that fresh flavor perfect for relaxing on the beach or on the back patio. Here at Short's, the trick is finding a way to refresh without being overbearing and without needing to introduce fruit when the beer is being served (we're neurotically wary of the contaminants present on the peel of fruit sliced at your favorite watering hole).

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Two examples of this approach at Short's are Nicie Spicie and Cerveza de Julie. While the base beer of Nicie Spicie is a wheat ale (probably the most common base for any fruit beer), Cerveza de Julie is a Mexican lager brewed with lime puree. As mentioned previously, Nicie Spicie uses orange and lemon zest. Neither of these base beers is heavily hopped, so rather than enhancing hop flavors, the citrus acts more in line with "traditional" fruit beers where the distinct citrus flavors stand out on their own.

#### *Using Citrus as a Flavor Balance*

The citric acid from citrus fruits can act as a balancing component in experimental beers containing an overly sweet malt base. Just about any beer with an abundant residual sweetness can be balanced with the tartness of citrus. Some of the most common instances are in sweet stouts or big brown ales. Bim Bam Boom is one of our newer rich stouts that uses orange puree to present a flavor profile akin to a chocolate-covered orange. In this particular beer, cocoa nibs and cayenne powder are also added for the full effect of a sweet and spicy dessert.

We've found golden ales to also be adept at providing a sweet backbone for a citrus addition. One of our most recognized specialty beers, Key Lime Pie, is an exception to the trend of adding citrus on the cold side. Key Lime Pie incorporates key lime puree on the hot side (i.e. upstream of the heat exchanger) after the wort has already received additions of graham crackers and marshmallows.

Brewing with citrus has been an evolving process at Short's. Its use as a brewing ingredient once seemed somewhat limited, but ever-expanding creative opportunities arise with each new experimental batch. As with all brewing, it takes fearlessness, strong technical knowledge, imagination, and ambition to create truly outstanding beers.

**Tony Hansen has been the head brewer at Short's Brewing Company in Bellaire, Mich. since 2007, coming from a culinary background. Short's is currently one of Michigan's largest craft breweries and chooses to distribute its products exclusively in its home state.**



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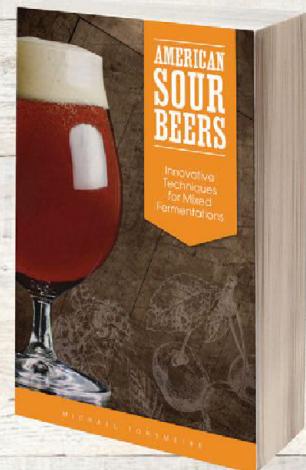
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# PEARLS OF WISDOM:

## Brewing Oyster Stout

BY J. WILSON





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Some folks knit their puzzled brows as they consider the notion. Some grimace in disgust. And others get excited at the possibility that introducing oysters into the brew kettle might just lead to their next beer epiphany. On the surface, oyster stout may not be for the faint of heart, but it only takes a swallow or two to learn that this unusual ingredient does indeed have a place in the brewhouse.

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A classic gastronomic pairing, oysters and stout (or porter) were frequent partners in Victorian England, when the mollusks were inexpensive and the popular dark brew filled many a mug. The distinctly sweet and salty oysters were a perfect counterpart to the roasty and smooth characteristics of stout.

In time, oysters moved from accompaniment to ingredient—probably starting only with the shells, due to the clarifying properties of their calcium carbonate makeup and their alkalinity, which countered sourness in beer. The shells served another purpose—enhancing bitter flavors and softening the beer's texture.

Later, perhaps in New Zealand in 1929, according to the late Michael Jackson, oysters made the leap into the kettle to enhance stout's savor with flavors

described as briny, earthy, minerally, and reminiscent of a sea breeze. British brewers followed suit, likely adding oysters as a fortifying agent in lean times, but they must have been intrigued by the subtle nuances the mollusks added to the finished pint.

For years, I've contemplated brewing an oyster stout, but held back to avoid ending up with a five-gallon error. However, some notions are difficult to shake, and I went in search of advice from experienced oyster stout brewers to inform my plan of action.

### GETTING STARTED

All the brewers I consulted agreed on one point: start with a solid base beer. Having spent years developing a number of porter and stout recipes, I felt confident that I had step one under control. But which

one to use? Commercial examples of oyster stout range widely, with HenHouse Brewing Company Oyster Stout on the low end of the alcohol spectrum at 4.9 percent ABV, and 21st Amendment Brewery's Marooned on Hog Island clocking in at 7.9 percent ABV (both breweries utilize oysters from Hog Island Oyster Company). A brief search turned up examples everywhere in between.

Since I learned that techniques for incorporating oysters into beer ranged from adding only the shells to shucked oysters to whole oysters, shells and all, I picked two beers that I thought would be appropriate: an oatmeal stout, and a somewhat Americanized version of a dry stout, with a bit of crystal malt for heft.

"Think about how oysters can make your beer better, not how to pack a whole

# PEARL JUICE OYSTER STOUT

OATMEAL STOUT

## INGREDIENTS FOR 5 U.S. GALLONS (19 LITERS)

8.0 lb (3.62 kg) Maris Otter malt  
2.0 lb (0.9 kg) flaked oats  
1.0 lb (454 g) roasted barley  
1.0 lb (454 g) 40° L crystal malt  
1.0 lb (454 g) 80° L crystal malt  
0.5 lb (226 g) chocolate malt  
0.5 oz (14 g) Magnum (13.4% a.a.) 60 min  
1.0 oz (28 g) East Kent Golding (5.5% a.a.) 30 min  
Wyeast 1028 London Ale yeast  
6 whole oysters—boil last 20 minutes  
12.0 oz shucked oysters (and liquor)—boil last 20 minutes

Brewhouse Efficiency: 75%

Original Gravity: 1.071

Final Gravity: 1.018

IBUs: 32

SRM: 39

## DIRECTIONS

Mash grains at 154° F (68° C). Boil wort for 60 minutes, adding hops and oysters as indicated. Cool and ferment at 70° F (21° C) for one week.

## PARTIAL EXTRACT VERSION

Substitute 6 lb (2.72 kg) pale malt extract syrup for Maris Otter pale malt. Steep remaining ingredients in 158° F (70° C) water for 30 minutes. Drain, rinse grains, dissolve extract completely, and proceed with boil.

bunch of oyster into your beer,” suggested Collin McDonnell of HenHouse Brewing Company. “Focus on the beer, and then bring in the unusual to complement the beer.”

Upright Brewing Company’s Alex Ganum uses both oyster liquor and whole oysters from Hama Hama Oyster Company in Washington to craft Upright’s Oyster Stout, a 2012 World Beer Cup bronze medal winner. “We use both oysters and oyster juice, which is basically sea water,” said Ganum, who noted that his 6.25 percent ABV riff on the style has just enough alcohol and residual sugar present to balance the brine character. “[The liquor] lends the briny character, while the oysters themselves give a hint of oyster flavor.”

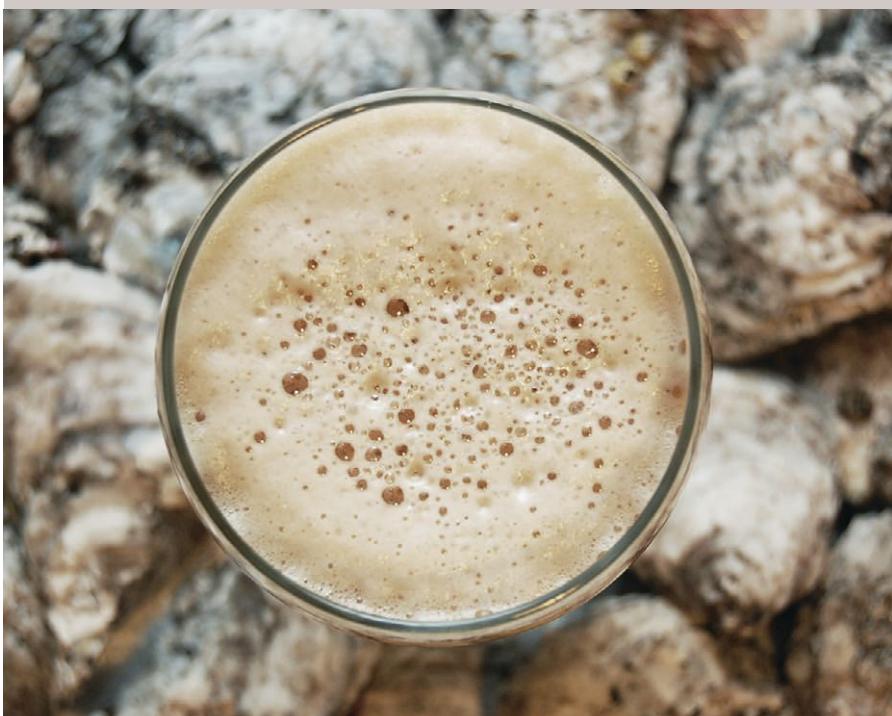
After polling a number of brewers, I found usage numbers ranging from one oyster per barrel to one pound of oysters per barrel. The oyster character in many oyster stouts is subtle. In fact, a common reaction is, “If you didn’t tell me there were oysters in it, I wouldn’t have known.” On this one, I wanted to be sure the briny character came through. Bill Leahy of Harpoon Brewing Company advised that 10 to 20 oysters for a five-gallon batch would be a good starting point. Ben Clark of Flying Dog Brewing Company uses a mere 50 oysters per 50-barrel batch. He said one could easily use up to four times that amount without negative consequences if the salinity is low.

## THE PLAN

Keeping these tips in mind, I decided that boiling the shells in the dry stout would add a delicate mineral accent to the roasted malt character while imparting a subtle hint of the sea. For my oatmeal stout, a beefier brew, I resolved to add a combination of whole oysters and additional shucked oysters, liquor and all. I didn’t want a seafood smoothie, but Ganum confirmed that I’d need a little more oyster profile to shine through the bolder flavors of this beer.

My brewing partner, Kyle Chafa, and I decided to add a dozen oyster shells (thoroughly cleaned with a scrub brush and water) to the dry stout and a half-dozen whole oysters plus 12 ounces of

Photos © J. Wilson



shucked oysters (and their liquor) in the oatmeal stout. In Iowa, I'm significantly inland, but there's a pretty good seafood market in Des Moines that gets fresh Delaware Estuary oysters in each day, so that's what we used.

After spending time with a six-pack of Flying Dog's Pearl Necklace, which is brewed year-round and widely distributed, and engaging in conversations with a half-dozen brewers, any reservations I'd had in the early days of this project had fallen away, though I'm not sure I can say the same for Kyle. I was eager to brew this beer, but Kyle looked like he had his doubts.

Our brew day arrived and I committed to the oatmeal stout, figuring that if I overdid the oyster liquor, I should be the guy suffering through an entire keg of the stuff. Shooting for an original gravity of 1.071, my grain bill consisted of eight pounds Maris Otter, two pounds flaked oats, one pound each of Crystal 40, Crystal 80, and roasted barley, as well as a half pound dark chocolate malt. I mashed at 154° F (68° C).

For the dry stout, we employed a simpler grain bill of seven pounds Maris Otter, a pound and a half of flaked barley, one pound each of Crystal 80 and roasted barley, a quarter pound of dark chocolate malt, and a half pound of Carapils, mashing at 154° F (68° C).

We transferred our worts to the kettle and utilized identical hopping, a bittering hop addition of a half-ounce Magnum (13.4 percent alpha acid) and a flavoring addition (at the 30-minute mark) of one ounce East Kent Golding (5.5 percent alpha acid) in both beers.

Kyle boiled his oyster shells (obtained for free at our local seafood market) in the dry stout wort for the full 60-minute boil, while I added my oysters and their liquor to the oatmeal stout with 20 minutes remaining in the boil.

Post-boil, we chilled the worts, and Kyle pitched Wyeast 1084 Irish ale yeast into his dry stout, while I went with Wyeast 1028 London ESB ale yeast for the oat-

meal version. Both beers fermented for seven days at 70° F (21° C).

Two important words of advice: boil the oysters and shells for at least 10 minutes—it's a seafood and needs to be cooked. Also, those with shellfish allergies should not drink oyster stout.

## TASTING NOTES

We joined forces a few weeks later for sensory analysis. Both beers carried the expected roasted grain/coffee/chocolate notes one would expect from a stout, and

while the oyster flavor wasn't earth shattering, it still made its presence known.

Each beer carried a soft minerality in the nose, with the oatmeal stout distinguished by a stronger kelp-nuanced hint of the sea.

While maintaining the base beers' integrity, the interplay of chocolate and wafting sea breeze in both beers offered a stealthy touch that—the rumors are true—one might not notice if they weren't told that these are oyster stouts. I wouldn't hesitate to brew either recipe again—and drink-



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## GOOD UNCLE OYSTER STOUT

IRISH DRY STOUT

### INGREDIENTS FOR 5 U.S. GALLONS (19 LITERS)

7.0 lb (3.17 kg) Maris Otter malt  
1.5 lb (680 g) flaked barley  
1.0 lb (454 g) roasted barley  
1.0 lb (454 g) 80° L crystal malt  
0.5 lb (226 g) dextrin malt  
0.25 lb (113 g) chocolate malt  
0.5 oz (14 g) Magnum (13.4% a.a.) 60 min  
1.0 oz (28 g) East Kent Golding (5.5% a.a.) 30 min  
Wyeast 1084 Irish Ale yeast  
12 oyster shells—boil 60 minutes

Brewhouse Efficiency: 75%

Original Gravity: 1.060

Final Gravity: 1.013

IBUs: 35

SRM: 33

### DIRECTIONS

Mash grains at 154° F (68° C). Boil wort for 60 minutes, adding hops and oyster shells as indicated. Cool and ferment at 70° F (21° C) for one week.

### PARTIAL EXTRACT VERSION

Substitute 6 lb (2.72 kg) pale malt extract syrup for Maris Otter pale malt. Omit dextrin malt. Steep remaining ingredients in 158° F (70° C) water for 30 minutes. Drain, rinse grains, dissolve extract completely, and proceed with boil.

ing a full five gallons of either would be a pleasure, not a chore.

"The toughest thing about trying to create a consistency in an oyster stout has proved to be that oysters are not consistent," said McDonnell. "Some are super salty, some are sweet, some have a ton of minerality, and some don't."

Clark agreed. During his pilot batching process for Flying Dog's Pearl Necklace, a 5.5 percent ABV dry stout brewed with Rappahannock River Oysters, Clark found striking a good salinity balance from the wide range of oyster characteristics available to be a challenge.

While McDonnell elected to live with the batch-to-batch differences inherent in brewing with oysters, Clark took a different approach to work toward greater consistency. "We found that adding a small addition of sea salt to Pearl Necklace helped pronounce a subtle briny undertone from the oysters, and also added to the palate fullness of the beer," he said. "We wanted to ensure precise control over our batches, so we selected river oys-

ters, which had the least salinity, allowing us to dial in the addition of the sea salt."

Dissolving sea salt, a natural flavor enhancer, into sanitary water as Clark suggested is a useful method for bringing the sea character up a notch if so desired in a "lightly oastered" brew, or to correct for using oysters with lower salinity. Ganum agreed, noting that adjusting the salt level post-fermentation would increase the savory quality of the finished beer.

With Ganum's beer medaling at the World Beer Cup in the Indigenous Beer category and Flying Dog's iteration garnering a silver at the 2013 European Beer Star in the Dry Stout category, there is evidence to suggest that oysters are less an unusual ingredient and more a secret weapon.

**J. Wilson** is an award-winning homebrewer, BJCP Certified beer judge, and the 2012 Beerdrinker of the Year at Wynkoop Brewing Co. in Denver. He is the author of *Diary of a Part-Time Monk* and blogs at [brewvana.net](http://brewvana.net). He lives in rural Adams County, Iowa, with his wife and two sons.

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# *Crafted Classics:* HOME BREWING VINTAGE BEERS

BY PATRICK DAWSON

PHOTOS BY LINDSAY DAWSON



**M**any homebrewers have been guilty of the forgotten bottle—that lone IPA, wheat, or pale ale stumbled upon when moving boxes in the basement. But that likely won't deter them from opening up that bottle for a taste, because who knows what gem awaits in the glass?

Unfortunately, though, the beer is likely stale, dull, and not even close to what was dreamed up when it was brewed, since the vast majority of beer styles begin a slow decline after fermentation.

But what if that bottle happened to be a barleywine? Or an imperial stout? Or better yet, a lambic? That individual just might have discovered the joy that time in the cellar can bring to particular beer styles when they're brewed properly.

What is it about certain beers that improve with time? Are they like stews that become richer as flavors integrate? Do particular ingredients enable beer to be cellared longer? Is it the amount of these ingredients that foretells the future? In this article, we'll explore what makes a beer more suited to aging and how to brew a vintage beer.

### VINTAGE NECESSITIES

First, consider what styles tolerate age the best. Why does a Baltic porter develop rich berry and dark cacao notes over time while an Irish stout becomes papery and cloying? There are many factors, but the key is to understand the role of oxidation, the principal contributor to how a beer ages.

Brewers generally associate oxidation with stale, cardboard-like character, though under the right conditions, oxidation can instead bring pleasant, heady notes of port, hazelnut, and dried fruit.

Oxidation is sure to occur in any beer, but it can be slowed by increased alcohol, which essentially acts as a preservative. This slow development is crucial because positive oxidation-derived characteristics take time to develop and can't be rushed. The necessity for lengthy maturation is not unlike the process for slow-cooking meat. The extra time and low cooking temperature allows collagen and connective tissue to slowly gelatinize, and protein to remain tender rather than become tough and chewy. Similarly, the complexities derived from cold, controlled oxidation in vintage beer would instead

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## THE GOOD DOCTOR'S ENGLISH BARLEYWINE

### INGREDIENTS

for 3 U.S. gallons (11.35 L)

<b>15.0 lb</b>	(6.8 kg) Maris Otter malt
<b>8.0 oz</b>	(227 g) Victory malt
<b>12.0 oz</b>	(340 g) 120° L crystal malt
<b>12.0 oz</b>	(340 g) carastan malt
<b>2.0 oz</b>	(57 g) Cluster hops, 6.8% a.a. (60 min)
<b>1.0 oz</b>	(28 g) Cluster hops, 6.8% a.a. (25 min)
White Labs WLP002 English Ale Yeast, with 1 quart starter	
<b>1 Tbs</b>	yeast nutrient
<b>1</b>	oak spiral (heavy toast) soaked the week prior in bourbon

**Original Gravity:** 1.108

**Final Gravity:** 1.028

**IBU:** 70 (calculated)

**SRM:** 25 (calculated)

### DIRECTIONS

Create yeast starter the day prior to brewing. On brew day, mash grains at 154° F (68° C) for one hour. Sparge with sufficient amount of water to collect 6.5 gallons (24.61 L). Boil until 3.5 gallons (13.25 L) remain (approximately 3-4 hours depending on setup). Add hops at stated intervals. Leave 0.5 gallon (1.89 L) behind to avoid trub transfer. Add yeast nutrient and ferment at 80° F (27° C). Add oak spiral once primary fermentation has completed and steep for 1-2 weeks depending on preferred taste. Age for six months in carboy and then bottle using 2.5 ounces of corn sugar to prime. Enjoyable after a year and up to 10 years.

### EXTRACT VERSION

Substitute 9.75 lb pale malt extract syrup for Maris Otter malt. Steep remaining grains for 30 minutes in 154° F (68° C) water. Drain, rinse grains, and proceed with boil.

## THE ENGINEER'S BELGIAN QUAD

### INGREDIENTS

for 3 U.S. gallons (11.35 L)

<b>12.0 lb</b>	(5.4 kg) Belgian Pilsner malt
<b>0.4 lb</b>	(181 g) Special B malt
<b>1.4 lb</b>	(635 g) Caramunich malt
<b>1.0 lb</b>	(454 g) Belgian dark candi sugar
<b>1.0 lb</b>	(454 g) Belgian light candi sugar
<b>1.0 oz</b>	(28 oz) Hallertau hops, 4.3% a.a. (60 min)
<b>0.5 oz</b>	(14 oz) Hallertau hops, 4.3% a.a. (30 min)
White Labs WLP550 Belgian Ale Yeast, with 1 quart starter	
<b>1 Tbs</b>	yeast nutrient

**Original Gravity:** 1.092

**Final Gravity:** 1.014

**IBU:** 28 (calculated)

**SRM:** 37 (calculated)

### DIRECTIONS

Create yeast starter the day prior to brewing. On brew day, mash grains at 154° F (68° C) for one hour. Sparge with sufficient amount of water to bring it to 4.5 (17.03 L) gallons. Boil until 3.5 gallons (13.25 L) remain (approximately 1 to 1.5 hours depending on setup). Add hops at stated intervals. Add Belgian candi sugar at flameout and stir until dissolved. Leave 0.5 gallon (1.89 L) behind to avoid trub transfer. Add yeast nutrient and ferment at 80° F (27° C). Age for four months in carboy and then bottle using 3 ounces of corn sugar to prime. Enjoyable after nine months and up to four years.

### EXTRACT VERSION

Substitute 7.8 lb pale malt extract syrup for Belgian Pilsner malt. Steep remaining grains for 30 minutes in 154° F (68° C) water. Drain, rinse grains, and proceed with boil.

turn stale and cardboard-like if the aging was accelerated, for example by heat or improper handling.

An alternative to a high ABV is the use of smoked malt, which can also slow the aging process, similar to how the smoking of meat helps preserve it from spoilage. Similarly, the acidity in sour beers also stalls the aging mechanisms and allows time for subtle new flavors to emerge. So there are indeed specific ingredients one can use to extend the shelf life of certain beer styles.

Malt melanoidins, the byproduct of browned malt sugars and proteins, are also critical to the makeup of vintage beers. While not preservatives, they do create the classic sherry and port vintage flavors if allowed to oxidize slowly over time. Fusel alcohols are also important as they break down into aldehydes—these compounds can have a wide spectrum of desirable flavors (though typically sweet), ranging from caramel to toffee and even amaretto.

Beers fermented with phenol-producing yeast strains like many of the Belgian ale yeasts will see those initially spicy notes (clove, pepper, smoke) develop into vanilla, leather, and tobacco. In much the same way, yeast esters undergo a high volatility over time. German weisse esters (banana, bubblegum) lessen with age, and tree and stone fruit esters can transform into dried fruit nuances like fig, raisin, and dried apricot.

It should also be noted that over time, a beer's grain-based proteins and starches slowly drop out, thinning a beer. Nobody likes a watery beer, so many vintage styles benefit from a thick, chewy base so they still have some body left by the time they are ready to drink.

Another important piece of the puzzle is the hop profile. Hop bitterness fades over time, so beers meant for aging must have an appropriate amount at the start. Hop flavor and aroma disappear even more quickly, so vintage beer can't rely on a hoppy bouquet to complement other flavors. Additionally, the bitterness that comes from a hop's beta acids is more resilient than alpha acid-derived bitter-

ness, so it's best to choose a hop varietal with a favorable beta-to-alpha ratio (noble and English types, for example).

Finally, barrel use is common when aging beer, whether strong or sour (or both). Oak is slightly porous by nature and slowly allows oxygen into the beer, so that oxidative flavors develop over time. Oak-derived flavors like vanilla, cinnamon, and coconut have proven to be quite hardy over time and are a dependable presence in an ever-changing vintage beer.

## OPTIMAL STYLES

Now that we know what makes a good aging beer, certain styles should jump out as prime cellaring candidates.

**English barleywines:** High ABV, beta-rich hops, and loads of fusels and esters make this one of the most cellarable styles out there. Look for them to develop caramel sweetness, along with dried fruit and Madeira flavors over the years (10 or more).

**American barleywines:** Intensely hoppy and typically less estery and boozy than

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their English counterparts, American barleywine's aging potential is a bit more limited. Look for sweet, sherry-like development over time, but avoid aging too long (three years max) to retain some of the hopiness that makes these bruisers so special.

**Belgian quads:** Essentially Belgian barleyswines, the high levels of phenols and fruity higher alcohols of Belgian quads make these a fantastic recipe for vintage success. Plan for the spicy phenols to take on vanilla and leather flavors and

the higher alcohols and esters to develop subtle dried fruit notes. Five years is a typical max.

**Imperial stouts:** With their strong coffee-like roastiness, a hefty hop bitterness, and imperial strength, these black beauties can benefit from some cellar time. Age will mellow the espresso flavors into dark chocolate and the fusels can acquire a ruby port-like flavor. The high melanoidin content makes them show their age faster than most, so just a year or two is typically optimal.

**Flanders red ales:** High acidity enables slow development, but the fact that most commercial examples are pasteurized prior to bottling stops the Brettanomyces from consuming all the residual sugars. Vintage examples retain a fruity tanginess, but also showcase rich oxidative notes of port, caramel, and dried fruit.

**Lambic and gueuze:** Often quite sour and intensely funky, these beers age impressively well due to their low pH, despite a relatively low ABV. Over long periods of time (three or more years), the acidity should soften, allowing the more subtle flavors of fruit (pineapple, rhubarb) and bière de garde must to shine.

#### HOME BREWING TECHNIQUES

There is much to consider when designing and brewing a vintage beer. Once again, the primary consideration is oxidation. While certain oxidation byproducts can be a good thing in a vintage beer, it's still important to minimize oxygen uptake after fermentation. Otherwise the beer will develop stale, papery flavors. Also be aware of hot side aeration during the brewing process: hot wort oxidation, specifically melanoidin oxidation, can occur at temperatures above 80° F (27° C), so make sure no oxygen is introduced until the wort is below this temperature.

Next on the list is increasing residual sugars by choosing a yeast strain with low attenuation. The body can be further boosted with a thin, relatively hot (154° F or 68° C) mash, which will produce long chain malt sugars that don't wholly ferment. Wheat beers such as lambics should be made using a turbid mash technique and with unmalted wheat so as to leave behind plenty of unfermentable starches.

To ramp up the esters, phenols, and fusels, don't be afraid to crank up fermentation temperatures, thereby creating the building blocks necessary for vintage flavors like dried fruit, amontillado, vanilla, and tobacco. Many commercial brewers with vintage beer pedigrees keep their primary fermentation temperature in the 80s and (very occasionally) the 90s. The beer will taste hard and boozy fresh, but the years will transform it into a delectable sipper.

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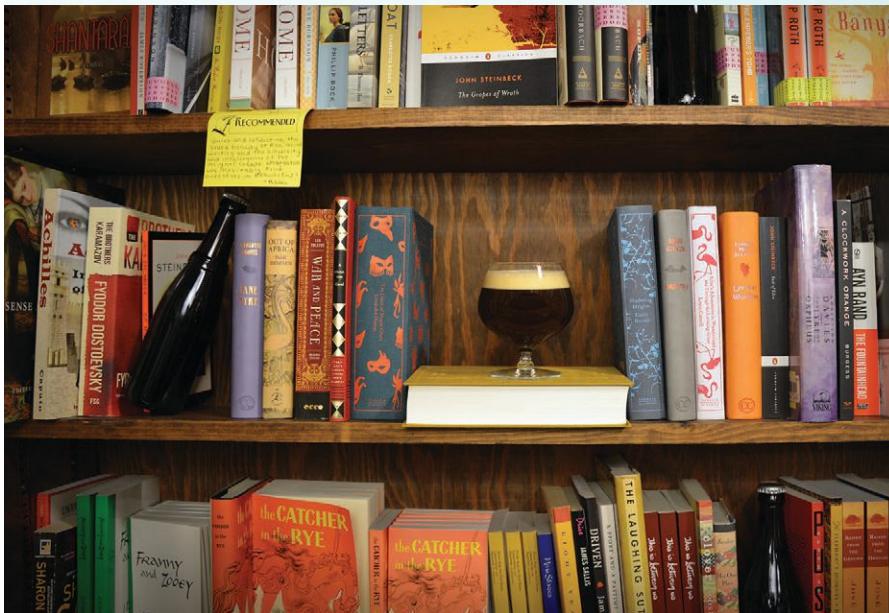
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# THE PROPER CELLAR



Not only does a beer need to have the makeup to age well, it also needs to be aged in the right environment. Follow these general guidelines when choosing the best place to cellar beer.

**Temperature:** Beer ages fast when warm and slow when cold. For ales, an ambient temperature of 55° F (13° C) has been found to be a good compromise, but one could certainly go as high as 65° F (18° C) or as low as 45° F (7° C) and still attain respectable results. No matter what, never exceed the fermentation temperature.

**Consistency:** Almost more important than the cellar temperature at any given moment is the potential for change in cellar temperature. Steady temps enable aging processes to occur cleanly and completely. If this isn't possible, a good solution is to utilize styrofoam wine boxes to insulate beer from temperature fluctuations.

**Light:** Though brown glass blocks the majority of damaging UV rays, given a few years, even artificial light will skunk the beer if exposed. Avoid the decorative wine racks and keep your vintage beers safely in the dark.

**Humidity:** Not an issue except for cork-enclosed beers. If aging more than a year or two, wax-dip the corks to prevent drying, or ditch them altogether. Be wary of refrigerators that experience very low humidity levels.

**Bottle Orientation:** The hottest debate in the vintage world. Stored horizontally, beers maximize the surface area of the trub and head space, optimizing the secondary conditioning that occurs in the first year. However, after that, the large trub surface area increases the potential for autolysis flavors (blood, rust, teriyaki). Turn them vertical after a year, otherwise just store them standing.

*Much like a  
classic novel,  
great vintage beers  
can stand the  
test of time.*





After four hours of boiling, the barley-wine wort is reduced and darkened via kettle caramelization.



In lambics, unmalted wheat berries leave behind unfermentable starches allowing the beer to retain a satisfying mouthfeel even after years of aging.



In a pinch, hops can be “aged” in the oven.

## THE SINGER'S FAUX LAMBIC

### INGREDIENTS

for 5 U.S. gallons (18.92 L)

- 2.5 lb** (1.1 kg) soft, unmalted whole wheat berries (available in bulk at natural grocers)
- 2.8 lb** (1.3 kg) two-row malt
- 2.8 lb** (1.3 kg) six-row malt
- 1.0 lb** (454 g) rice hulls
- 4.0 oz** (113 g) 3-year-old, low alpha acid noble hops (120 min)

Wyeast 3763 Roeselare Ale Blend, with 1 quart starter

Used 5-gallon barrel

**Original Gravity:** 1.040

**Final Gravity:** 0.999

**IBU:** 10 (estimated)

**SRM:** 3 (calculated)

### DIRECTIONS

Grind unmalted wheat berries in malt mill until the consistency of grits; this takes approximately four passes through. If in need of aged hops, ask your local shop if they have any “expired” hops. They are also available through online retailers. In a pinch, bake in the oven spread out on parchment paper at 160° F (71° C) for six hours. To maintain oxygen exposure, an actual barrel is preferred over a glass carboy, but oak spirals/chips can be used

if necessary. Create yeast starter the day prior to brewing. Add 2 gallons (7.57 L) of water to milled wheat and bring to a boil to gelatinize the wheat. Boil for 15 minutes while stirring constantly. Cool to 166° F (74° C) by adding approximately 2.5 cups (591 mL) cold water and stirring. Add 0.75 lb (340 g) two-row and 0.75 lb (340 g) six-row malt and add to mash tun. Let mash for 1 hour. Add remaining malt and rice hulls and 1.25 gallons (4.73 L) of 175° F (79° C) water and mash for another hour. Sparge with enough 190° F (88° C) water to bring it to 7 gallons (26.5 L). This will help to avoid a stuck sparge and husk tannin extraction is a minimal concern due to the use of the huskless berries. Additionally, any husk-derived compounds extracted from the malt will be consumed by the Brettanomyces over the years.

Add hops and boil to reduce volume to 5 gallons (approximately 1.5 to 2 hours depending on setup). This length of boil should eliminate any cheesy flavors from the aged hops. Rack to barrel and ferment at 65° F (18° C). Age in barrel for up to three years. Tartness from the lambic bacteria cultures in the blend will develop by 18 months. Bottle using 5 ounces of corn sugar to prime. Beer continues to improve in the bottle indefinitely.

In high gravity beers, the use of a starter is a must. Prior to fermentation, the wort is a thick, viscous stew and the yeast needs a running start and plenty of nutrients to cut its way through.

When it comes to sour ales, ensuring a substantial acidity is key. Brettanomyces on its own creates very little acidity and needs Pediococcus and/or Lactobacillus to create high levels of lactic acid.

With beers that are complemented by sherry and port flavors, make sure your grain bill includes plenty of melanoidin-rich malt. Munich and Maris Otter are good high-kilned base malts that will serve this purpose better than a combination of two-row pale and crystal malts. Very long boils will also produce copious amounts of melanoidins via kettle caramelization. Vintage-savvy breweries often use three-plus-hour boils for their strong keeping ales.

**Patrick Dawson** is the author of the book *Vintage Beer*, which further explores the cellaring of beer. He is an avid homebrewer, beer writer, and member of the Denver Brew League. 

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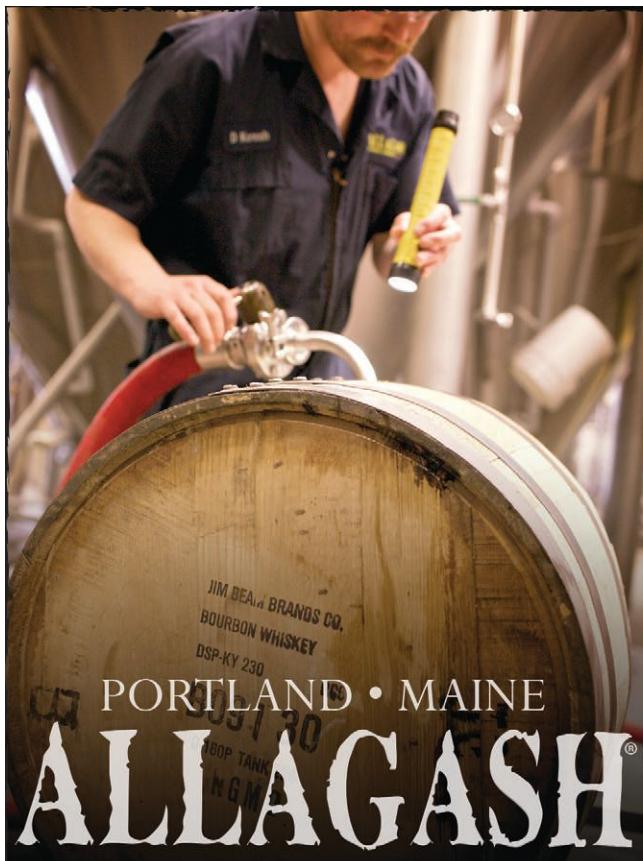
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Continually pushing  
the limits of  
beer and ourselves.



The background of the entire image is a photograph of a sunset over a body of water, with a silhouette of buildings in the distance. In the foreground, a single glass of beer sits on a dark wooden surface. The beer has a golden color with a thick white head. The glass is positioned centrally, with its base resting on the wood.

# BREWING WATER SERIES: BAVARIA

BY MARTIN BRUNGARD

*EDITOR'S NOTE: This ongoing series explores the water quality from famous brewing centers, its effects on beer styles, and the relevance to modern day homebrewing.*

# GERMANY IS HOME TO SOME OF THE WORLD'S FINEST BEERS.

German brewers have long lived within the confines of the Reinheitsgebot (German purity law) when crafting their beer. The stipulations of that law and the limited resources it allows can make brewing challenging. But when done right, the result is often stunning. In achieving the high quality their beers are known for, brewers had to learn how to work with their water. This article focuses on water from the region around Munich known as Bavaria.

Bavaria, situated near Germany's southern border with Austria, is an area steeped in a rich brewing history. The region includes some of the oldest breweries in the world. Southern Bavarian cities with notable brewing history include Munich, Freising, Aying, Erding, and Kelheim. Well-known breweries from those cities that distribute to the U.S. are listed in Table 1. Figure 1 shows the location of those cities across the region.

For purposes of this discussion, the southern Bavaria region has been delineated as a crescent-shaped area stretching across southern Germany that is bounded by the German/Austrian border to the south and the Danube River to the north. Figure 1

depicts the limits of the region and the geography that defines it.

The border between Germany and Austria is dominated by the high mountain range of the Alps, largely composed of limestone and dolomite rock in that area. Those mountains are continually pushed upward by continental tectonic movements. However, glaciers and rainfall continually erode the mountains. That eroded material from the mountain range is carried by glacial and river transport to the lowlands north of the mountains. The Danube River marks the lowest reach of the region. Figure 1 shows that the geography across this region is similar to the mountainous Alps, Alpine Foreland, and Bavarian Hill Country. For that reason, the geology across this arc is also similar.

Numerous rivers flow from the Alps across southern Bavaria to the Danube. Those rivers could serve as the water supplies to the various communities along their runs. However, most Bavarian cities

do not draw their water from those rivers. The inhabitants of the region learned long ago that river water carries disease. Prior to the development of modern water treatment methods, groundwater from the wells was a safer water supply due to the filtering action of the soil. Disease-causing microbes are generally filtered out of well water. Most communities in this region have used wells for several hundred years.

## GEOLOGY

The limestone and dolomite of the Alps have been eroding into the Danube River valley for more than 15 million years. That erosion has distributed a variety of soil and rock across the region. Layers of sand, gravel, silt, and clay have accumulated across the hills and plains stretching from the mountains to the Danube. Most of those deposits are permeable sand and gravel that overlay silt and clay layers. Figure 2 shows a generalization of the geologic cross-section extending from the Alps to the Danube.

FIGURE I: GEOGRAPHY OF SOUTHERN BAVARIA



TABLE I: NOTABLE SOUTHERN BAVARIA BREWERIES

City	Breweries
Munich	Augustiner Hacker-Pschorr Paulaner Spaten-Franziskaner
Aying	Ayinger
Erding	Erdinger
Freising	Weihenstephan
Kelheim	Schneider & Sohn

The sand and gravel in this region is composed largely of limestone and dolomite. Limestone is composed of calcium carbonate and dolomite is composed of calcium magnesium carbonate. Groundwater flowing through those sand and gravel deposits quickly becomes saturated with calcium and magnesium ions that create "hardness" in the water. Along with those hardness ions, the carbonate also dissolves into the water to create alkalinity.

FIGURE 2: GENERALIZED GEOLOGY OF SOUTHERN BAVARIA

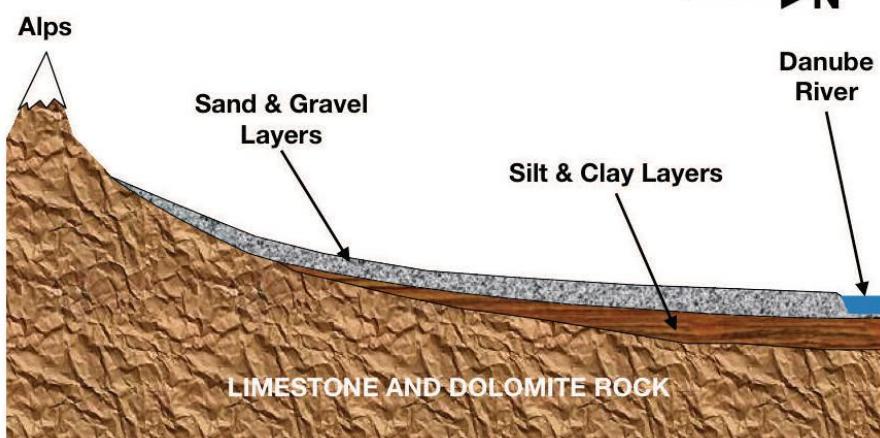


CHART I: RAW GROUNDWATER QUALITY ACROSS SOUTHERN BAVARIA

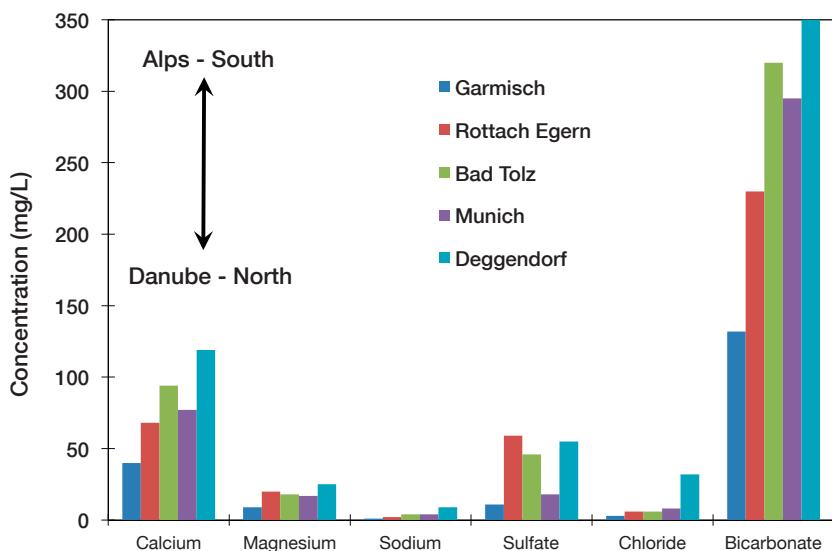


TABLE 2: WATER QUALITY IN SELECT BAVARIAN CITIES

City	Munich	Aying	Erding	Concentration (mg/L)	
				Ion	Concentration (mg/L)
Calcium	77	98	90		
Magnesium	17	25	29		
Sodium	4	6	10		
Sulfate	18	12	17		
Chloride	8	22	10		
Bicarbonate	295	355	390		

The general slope of the region from the mountains to the Danube valley helps move groundwater toward the Danube. The longer the groundwater is in contact with the limestone and dolomite, the more mineralized it becomes.

#### WATER QUALITY

Drinking water quality reports from cities across southern Bavaria show a distinct trend. Chart 1 shows the variation in

groundwater quality between the Alps and the Danube River for several cities. The ionic concentrations show a clear increase from the modest levels near the Alps (city of Garmisch) to the higher levels near the Danube River (city of Deggendorf). Notable in the chart are the low and relatively constant concentrations of magnesium, sodium, sulfate, and chloride in the water supplies. It is primarily the calcium and bicarbonate concentrations that rise as the groundwater flows northward from the Alps to the Danube. Readers should note that milligrams per liter (mg/L) is also known as parts per million or ppm.

Calcium, magnesium, and bicarbonate are components that create temporary hardness in water. Temporary hardness can be removed from water by boiling, as the calcium and bicarbonate precipitate out of the water as chalk. Permanent hardness is the combination of calcium, magnesium, sulfate, and chloride. Permanent hardness cannot be removed from water by boiling or lime-softening treatment methods and those combinations of ions remain in the water in most cases. For the Bavarian waters tabulated above, the relatively low concentrations of magnesium, sulfate, and chloride mean there is little permanent hardness in those waters.

To provide a broad view of water quality in famous Bavarian brewing cities, Table 2 presents their current water quality. Given the fact that these cities continue to draw from the same historic groundwater sources, their current quality should be similar to their historic quality.

Since the cities in Table 2 are no more than 30 miles apart, it is not surprising that their water quality is similar. As in Chart 1, the primary differences in the water quality for these cities is the calcium and bicarbonate content.

Notable in these Bavarian water profiles is the low sodium, sulfate, and chloride content. The magnesium content is also seemingly low in these waters. However, the recommended upper limit for magnesium in brewing water is around 40 mg/L and that low magnesium content is surprisingly close to that limit. While magnesium cannot be removed from

# BAVARIAN BREAKFAST

A Bavarian hefeweizen is a great complement to not only a breakfast of eggs and Bavarian wursts, but also many light or spicy foods. Hefeweizen is suited to spring and warmer weather. This light and spritzy beer welcomes the use of moderately alkaline water with a healthy dose of lactic acid. Tartness is common to style, and neutralizing moderately alkaline water with lactic acid brings the mash pH down and adds the lactate that is a signature flavor in this beer. A somewhat low calcium water content helps reduce yeast flocculation and enhances the cloudiness that is a hallmark of the style. Abandoning the 50 mg/L minimum calcium content for the brewing water is OK for this style.

Bavarian waters have little “flavor ion” (magnesium, sodium, sulfate, or chloride) content, so the water allows malt flavor to dominate beer profiles. The relatively high alkalinity of those waters must be neutralized with lactic acid and the remaining lactate ion can influence the beer flavor. Brewers with very high alkalinity water should boil, lime-soften, or dilute their water to leave around 100 mg/l bicarbonate in the water and rely on lactic acid for the remaining alkalinity neutralization.

The malt bill for a hefeweizen includes a high percentage of wheat malt with the remainder consisting of Pils malt. A decoction mash is a traditional brewing method that adds melanoidins. To provide a similar result when infusion mashing, a small percentage of melanoidin malt can be added. The weizen yeast with its clove and banana character is a prominent component of the overall beer flavor. Hop flavor and aroma are purposely absent to allow the yeast character to shine. Hop bitterness is also very low in this style.

## Ingredients for 5.5 U.S. gallons (21 L)

5.5 lb (2.25 kg) wheat malt  
3.5 lb (1.6 kg) Pilsner malt  
0.25 lb (110 g) melanoidin malt  
0.5 lb (226 g) rice hulls (in mash)  
11 IBUs Noble hop pellets @ 60 min  
German Weizen yeast

Original Gravity: 1.050  
Final Gravity: 1.012  
SRM: 4  
IBU: 11  
Assumed Efficiency: 78%

## Directions

Mash all malts and rice hulls in lactic-infused water (acidify as necessary to produce a mash pH of 5.1 to 5.3). If adherence with Reinheitsgebot is desired, use acid malt in the grist to provide the necessary acidification. An initial mash temperature around 111° F (44° C) for 15 minutes enhances the formation of clove flavor in the final beer. Although this low temperature step is recommended, it can be omitted and a single saccharification mash temperature used. Step the mash to a saccharification temperature

*“This light and spritzy beer welcomes the use of moderately alkaline water with a healthy dose of lactic acid.”*



between 148 and 153° F (64 to 68° C) for 45 minutes. A mash out step to 168° F (75° C) is helpful, but optional. Sparge the mash with low-alkalinity water that is acidified to a pH between 5.2 and 5.5. Boil the wort for 90 minutes. Low mineral content is desirable for the brewing water. To produce low mineralization when using RO or distilled water, add 2/3 tsp of calcium chloride per 8.5 gallons (32 L) of water as the minimum treatment or use a program such as Bru'n Water to guide the mineral and acid additions needed to produce a brewing liquor similar to that shown in Table 3. If the tap water has high levels of any ion, dilution with RO or distilled water is recommended. Any noble hop is suitable for brewing this beer. Calculate the hop quantity to produce about 11 International Bittering Units (IBUs) based on the hop's alpha acid content. Add the hops at 60 minutes to avoid any flavor or aroma contribution in the finished beer. Carbonate the finished beer to at least 3 volumes of CO<sub>2</sub> to produce the large head and effervescence the style is known for.

**Extract Version:** Substitute 6 lb (2.7 kg) of dry wheat malt extract (DME) or 7.5 lb (3.4 kg) wheat malt extract syrup for the malts in the recipe. Prepare the water as indicated above. Boil as indicated above.

water by boiling, it can be removed by lime-softening. Some German breweries are known to employ lime-softening as a pretreatment for their brewing water. Therefore, it is possible that the brewing water in these Bavarian breweries has magnesium content as low as 3 mg/L after lime-softening. Employing the relatively high natural magnesium levels shown in Table 2 may be undesirable for brewing usage and may not depict what all breweries in the region use.

Reverse osmosis (RO) water treatment has been in widespread use for about 40 years and is an option for reducing the ionic content of water. Since the RO

process only removes constituents from water and does not add them, it is a legal treatment option for modern German brewing. Some modern breweries do use RO to demineralize their brewing water and it is possible that some beers brewed in this region are no longer brewed with the historic water quality. Since this process does not reflect the water conditions faced by historic German brewers, it was not considered in this article.

#### HOW THEY BREW

The high concentration of bicarbonate in these Bavarian waters can make them difficult to brew with. Bicarbonate and its related forms, carbonate and carbonic acid,

create alkalinity in water. Excess alkalinity can keep mash and wort pH from dropping into a preferred range between 5.2 and 5.6. High pH can contribute to poor mash conversion and poor beer flavor. Therefore, the first order of business for those historic Bavarian brewers was to reduce the alkalinity for brewing.

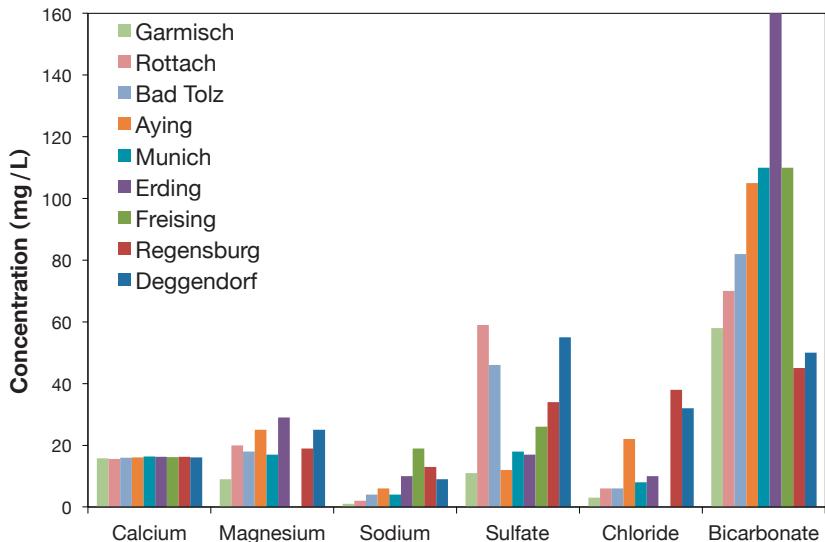
A technique available to brewers for centuries is pre-boiling the brewing water. Pre-boiling water that has high temporary hardness drives off carbon dioxide ( $\text{CO}_2$ ) from the water and causes calcium carbonate (chalk) to precipitate from solution and deposit at the bottom of the kettle. Lime-softening is another process that also drives off  $\text{CO}_2$  and causes chalk to precipitate. When the chalk has settled and the water is clear, the water is decanted off the sediment and is ready to use. This treatment reduces both hardness and alkalinity. Pre-boiling water with high temporary hardness can reduce calcium to a concentration as low as 12 mg/L and bicarbonate to as low as 40 mg/L. Unfortunately, these conditions may be difficult to achieve and slightly higher ending concentrations of 20 mg/L calcium and 60 mg/L bicarbonate may be more realistic.

With the ending concentration ranges above, it is possible to calculate the effects of boiling on calcium (Ca) and bicarbonate ( $\text{HCO}_3$ ) concentration in the water. The ending calcium content of the boiled water can be estimated using the simple formula below using the water's existing calcium and bicarbonate content and an assumption for the ending bicarbonate content. All concentrations are in mg/L or ppm.

$$\text{Ca}_{\text{end}} = \text{Ca}_{\text{start}} - [(\text{HCO}_3{}_{\text{start}} - \text{HCO}_3{}_{\text{end}}) / 3.05]$$

In the case of these Bavarian waters, an interesting limitation arises. These waters don't have enough calcium content to allow a high reduction in their bicarbonate content by boiling or lime-softening. As mentioned previously, the minimum calcium content following boiling pretreatment is somewhere in the range of 12 to 20 mg/L. If a typical ending bicarbonate concentration of 60 mg/L was assumed for these waters, the equation above could indicate a calcium content of less than 12 mg/L. Therefore, the equation

CHART 2: SOUTHERN BAVARIA WATER QUALITY (BOILED)



**They all laughed  
when I told them  
I make my own beer...**

**until I poured  
them a pint.**

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must be revised so that the final bicarbonate content is calculated based on the achievable ending calcium content. The revised equation is below.

$$HCO_{3\text{end}} = HCO_{3\text{start}} - [3.05 (Ca_{\text{start}} - Ca_{\text{end}})]$$

By using an ending calcium concentration in the range of 12 to 20 mg/L, the ending alkalinity for pre-boiled water can be estimated. For many Bavarian waters, the ending bicarbonate content will be around 100 mg/L. For brewing dark styles such as dunkel or bock, this bicarbonate content may be low enough to produce an acceptable mash pH. However, pale beer styles such as weizen or helles will require additional bicarbonate reduction in order to create proper mash pH conditions.

Common brewing practice outside of Germany employs mineral or acid additions to neutralize excess bicarbonate. However, those options are not permissible since the Reinheitsgebot allows the addition of only water, malt, and hops. To get around that limitation, natural acidification is commonly employed in German brewing. This is accomplished with an acid rest during mashing or by adding acid malt to the malt bill. Both of these methods rely on naturally produced lactic acid to provide the acid needed to neutralize the excess bicarbonate. This lactic acid usage infuses the wort with the lactate ion that can impart a notable flavor in beer. The taste threshold for lactate ion for most people is around 400 mg/L. When pre-boiling or lime-softening are employed to pre-treat brewing water, it is unlikely that the lactate concentration will be that high. At low lactate concentration, there may be a nuanced flavor contribution.

As noted in Table 2, most ion concentrations in natural Bavarian waters are fairly low except calcium and bicarbonate. With the relatively simple technique of pre-boiling, the calcium and bicarbonate content can be significantly reduced. To illustrate the effect of pre-boiling brewing water quality, Chart 2 presents a more comprehensive summary of water quality in various Bavarian cities. With the more advanced technique of lime-softening, the magnesium content can also be reduced along with a further reduction in

bicarbonate content. Since major breweries have utilized lime-softening for over a hundred years, it is prudent to consider that lime-softened waters may be more responsible for the flavor and character of modern and historic German beers. With that stipulation, a Bavarian water profile shown in Table 3 can be recommended.

An important condition should be recognized in the water profile in Table 3. The somewhat high bicarbonate content will still require neutralization with a portion of roasted malt in the grist or some form of lactic acid to enable the mash pH to fall into the appropriate range. The high bicarbonate content enables the brewer to use more lactic acid and leave more of the acid's lactate ion in the finished beer.

For brewers who use tap water with bicarbonate content significantly higher than 75 mg/L, treatment such as pre-boiling or dilution with RO or distilled water is advised since neutralizing bicarbonate content greater than around 300 mg/L may leave a noticeably tart lactate flavor in the beer. That lactate level is not likely to be considered a nuance!

Some Bavarian beer styles like hefeweizen benefit from a moderate lactate addition, but remember that too low a pH can adversely affect the mash. Brewers who want the extra zip from the lactate ion, but mash with low bicarbonate content water,

risk dropping the pH below the minimum acceptable mash limit. Therefore, another technique can be used to impart the desired lactate character into the beer without affecting pH. When using low-alkaline RO or distilled water for the mash, mix 0.35 grams of chalk with 0.6 milliliters of 88 percent lactic acid for each gallon of mashing water. Mix these components together in a small bowl prior to adding to the water to ensure that the reaction is complete. This mixture is neutral and does not add significant acidity or alkalinity to the water, but adds calcium and about 150 mg/L lactate. This approximates the level that might be produced in natural Bavarian brewing. Lactate can also be added to other Bavarian beer styles—darker beers would likely need less lactate and paler beers more. Although calcium lactate food supplements are available from drug and health food stores, those

**TABLE 3. RECOMMENDED BAVARIAN WATER PROFILE**

Ion	Concentration (mg/L)
Calcium	16
Magnesium	10
Sodium	5
Chloride	10
Sulfate	18
Bicarbonate	75
Residual Alkalinity (RA)	44

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supplements have varying quantities of fillers and binders that make it difficult to quantify how much lactate they contribute. Creating your own calcium lactate is more accurate.

Table 3 shows that the pre-treated Bavarian water has relatively low calcium content. Popular brewing guidance suggests that brewing water should always have at least 50 mg/L calcium. But the Reinheitsgebot does not allow mineral additions in the brewhouse. In addition, there are hundreds of fine beers that are routinely brewed with low-calcium water.

This raises the question: is higher calcium content required in brewing water?

There are several reasons why that minimum calcium content is recommended for brewing water. It provides improved enzyme activity, builds yeast cell walls, aids in mash pH reduction, improves yeast flocculation, and reduces beerstone formation. Notice that taste and flavor are not in that listing. For lighter tasting and malty beers, the evidence is that low calcium content is beneficial to their flavor. It is OK to ignore the 50 mg/L minimum for calcium content for brewing water.

Just recognize that it may require more yeast care, higher pitching rates, more beerstone removal, more lagering time, or filtration to produce great beer. Bavarian brewers prove that it can be done.

To illustrate the important effect of lactic acid and water chemistry in brewing water treatment, a German weizen recipe is included with this article.

#### WHAT IS AUTHENTIC?

Water profiles for Bavarian cities such as Munich have been published for years. However, they often leave out the additional steps the Bavarian brewers had to employ to get their water to work for their brewing. The overall low mineral content and modest bicarbonate content that is neutralized naturally with lactic acid is the key. A number of points to consider in your quest for authentic Bavarian beers are presented below.

- Moderate bicarbonate content (alkalinity) is welcome in Bavarian brewing water.
- Use lactic acid, acid malt, or an acid rest as necessary to neutralize the remaining bicarbonate, produce a desirable mash pH, and impart a modest lactate level in the wort.
- When brewing with low bicarbonate content water, adding calcium lactate may provide the lactate ion without driving the mash or wort pH too low.
- Low calcium content is acceptable in the brewing water and may improve the flavor of light and malty beers.
- All flavor ions (magnesium, sodium, sulfate, and chloride) should be at low levels (< 20 mg/L).
- A mash and kettle wort pH of 5.1 to 5.3 is recommended for Bavarian styles such as helles, weizen, bock, and dunkel.

**Martin Brungard** is a recognized expert in brewing water chemistry and an engineer specializing in water treatment. He is the author of the Bru'n Water software for brewing water adjustment. He was also a technical editor for Brewers Publications' book *Water: A Comprehensive Guide for Brewers* by John Palmer and Colin Kaminski.

The advertisement features a wooden shelf displaying various Briess products. On the top shelf, there are six containers of CBW specialty malts: "Bavarian Wheat", "Munich", "Sparkling Amber", "Traditional Dark", "Rye", and "Porter". Below these are two containers of Briess malt extracts: "White Sorghum Syrup" and "Pilsen Light". On the bottom shelf, there are two containers of Briess malt extracts: "Golden Light" and "Special Dark". Behind the containers is a wooden tray filled with different types of malt grains, ranging from light to dark. To the left of the tray is a logo for "BRIESS MALT & INGREDIENTS CO. All Natural Since 1876". At the bottom right, there is a call to action: "Ask your local homebrew store for handcrafted Briess malts and malt extracts today!"

by Amahl Turczyn Scheppach

## Son of Brewzilla

The annual Son of Brewzilla homebrew competition was judged November 22-23 at Fat Head's Brewery in collaboration with the 2013 Cleveland Beer Week (CBW). The not-for-profit CBW beer festival celebrated its fifth year with 16 northeast Ohio craft breweries collaborating to create seven small-batch brews, along with more than 350 events at 125 venues throughout greater Cleveland. Running from October 16-26, the 10-day week concluded with "BREWzilla: A Monster of a Beer Tasting," featuring craft beer creations from more than 80 breweries on the last evening of CBW. So it seems only fitting to dub the ensuing homebrew competition the offspring of this craft beer colossus.

The Son of BREWzilla competition is organized by one of Ohio's oldest homebrew clubs, the Society of Northeast Ohio Brewers (SNOB). This was the fourth year of the event, and the second year at the Fat Head's production brewery.

"Matt Cole from Fat Head's has been our most amazing supporter and has helped make this event possible each year," commented SNOB president Todd Donnelly. "The contest is a Cleveland Beer Week related event, and we also participate with donating to the Malone Scholarship fund that was established by CBW a few years ago."

In all, there were 628 registered entries, with 575 reaching the judging tables. Homebrew clubs from neighboring regions including SAAZ (Akron, Ohio), SODZ (Columbus, Ohio), and TRASH (Pittsburgh, Pa.) were also well represented.

The SNOBs also started a friendly rivalry with SAAZ (Society of Akron Area

Zymurgists, not to be confused with Florida's Spacecoast Associates for the Advancement of Zymurgy) and have a trophy (the Cuyahoga Cup) that the winning club gets to keep. Donnelly points out that the Cuyahoga Cup is associated both with his club's Son of Brewzilla contest in the fall and the Akron club's Wizard of SAAZ contest in the spring (March 7-18, 2014). "We are proud to say we kept the trophy in SNOB hands for all of 2013," Donnelly asserted.

That success will continue if SNOB members Andrew Mitchell and Mike Ontolchik have any say in it—the duo brewed the best of show beer from 2013's Son of Brewzilla, a smoked helles called Lagerfeuer.

Mitchell began brewing and entered his first AHA competition in 2010, brewing about once a month. He uses a 5-gallon all-grain system that includes a 5-gallon stainless steel hot liquor pot, a 10-gallon (37.85 L) stainless kettle, a 10-gallon cooler mash tun, and a 54k BTU propane burner.

"Mike and I have brewed quite a few lagers together in the past year and we are obviously very happy with the results," Mitchell commented. "We chose to collaborate because we only live about a mile apart. Mike's brewing setup is bigger and fancier than my little system, and I have better capacity for temperature-controlled fermentation and lagering."

The two brewed their BOS smoked helles in Ontolchik's garage on his 15.5-gallon Ruby Street Brewing System. They split the batch into two separate fermenters, and pitched WLP 830 German Lager yeast



Mike Ontolchik, Andrew Mitchell, and Todd Donnelly, left to right, with the Cuyahoga Cup.



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into one and WLP 833 German Bock yeast into the other. Both were fermented at about 52° F (11° C) and lagered at about 32° F (0° C) in a regulated chest freezer.

The WLP 833 batch won BOS at Son of Brewzilla, but a previous batch made with the same recipe using WLP 830 took second place BOS two months prior at the Haztoberfest competition in Erie, Pa.

"Mike designed the recipe," said Mitchell. "It's fairly simple and easy to recreate as long as you adjust the water profile appropriately and employ stable temperature-control methods throughout the fermentation and lagering phases."

Ontolchik has been homebrewing since December 2007, joined SNOB in January 2008, and was elected president in 2009. He held officer positions for four years before taking 2013 off to organize the club's larger events including its participation in the National Homebrewers Conference. He brews about 20 batches a year and has been a BJCP judge since

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## Lagerfeuer Smoked Helles

2013 SON OF BREWZILLA BEST OF SHOW

RECIPE BY ANDREW MITCHELL AND MIKE ONTOLCHIK

### INGREDIENTS

10 U.S. gallons (37.86 L)	
<b>10.0 lb</b>	(4.54 kg) Weyermann® Pilsner malt (52.6%) 1.7 SRM
<b>8.5 lb</b>	(3.86 kg) Weyermann® smoked malt (44.7%) 2.0 SRM
<b>0.25 lb</b>	(113 g) Weyermann® acidulated malt (1.3%) 1.8 SRM (optional)
<b>0.25 lb</b>	(113 g) Weyermann® melanoidin malt (1.3%) 30 SRM
<b>1.0 oz</b>	(28 g) Perle (6.1% a.a.) 60 min, 1.5 IBU
<b>1.0 oz</b>	(28 g) Tettnang (6.5% a.a.) 25 min, 8.5 IBU
Irish moss, 15 min	
White Labs WLP 830 German lager yeast and/or WLP 833 German bock yeast slurry (or use starter)	

**Original Gravity:** 1.052

**Final Gravity:** 1.010

**ABV:** 5.3%

**SRM:** 3.7

**IBU:** 20

**Batch Size:** 10 Gal

**Pre-Boil Size:** 14 Gal

### DIRECTIONS

70 minute infusion mash at 152° F (67° C) and 10 minute mashout at 165° F (74° C). Gather 14 gallons (53 L) of wort for a 90 minute boil. Chill to 50° F (10° C) before pitching yeast. Calcium chloride was used to accentuate the beer's maltiness. Use acidulated malt to adjust pH if necessary, based on brewing water. Chill to pitching temperature of 52° F (11° C) and pitch slurry. Ferment to completion and lager at 32° F (0° C).

**PARTIAL EXTRACT VERSION:** Substitute 11 lb (4.99 kg) Pilsner malt extract syrup for Pilsner malt, melanoidin malt, and acid malt. Mash 5 lb (2.27 kg) smoked malt at 155° F (68° C) for 45 minutes. Rauchmalt has sufficient diastatic power to convert its own starches. Drain, rinse grains, dissolve extract completely, and proceed with recipe. Note that partial extract version will be slightly less smoky than all-grain version.

2010. "I like homebrewing because I can be technical and creative at the same time," he said. "I've made many friends in both our local homebrewing and craft brewing communities."

After their second-place BOS collaboration at Haztoberfest, Mitchell and Ontolchik knew they had to re-brew it for Son of Brewzilla. They originally got the idea from SAAZ member Mike Malinowski, whose smoked helles took second place best of show at Wizard of SAAZ a couple years back.

"Andrew and I first brewed the recipe in March 2013 and then re-brewed it in September," said Ontolchik. "My half of the first batch was drained at NHC in the Hospitality Suite on Thursday afternoon. For the second batch, Andrew

and I each harvested yeast from different local brewpubs. I gathered WLP 830 from Market Garden Brewery in Cleveland, and Andrew harvested WLP 833 from Willoughby Brewing Company in Willoughby, Ohio."

Happily, Great American Beer Festival attendees will have a chance to taste Lagerfeuer at this year's event, because it's going pro—or at least Pro-Am. "Andrew and I are very excited to brew this beer at Fat Head's with Matt Cole and his crew for the GABF Pro-Am," said Ontolchik. "Matt is a huge supporter of SNOB and local homebrewers."

**Amahl Turczyn Scheppach** is associate editor for *Zymurgy*. He is a former professional brewer who now brews at home in Lafayette, Colo.

## KUDOS—BEST OF SHOW

### AHA/BJCP Sanctioned Competition Program

#### October 2013

- Fresh Hop Ale Festival, 40 entries—*Karl Vanevenhoven, Yakima, WA.*  
Brixtoberfest, 153 entries—*Andy Weigel.*  
Valdez Brew Fest, 42 entries—*Tom Spain and Eric Good, Anchorage, AK.*  
Good Beer Home Brew Competition, 105 entries—*Michael Navas, MD.*  
Central Oregon Battle of the Brews, 31 entries—*Devin Steinert, Bend, OR.*  
OktoberBest, 317 entries—*Andy Melchers, Cincinnati, OH.*  
Fredericksburg Brew Fest, 103 entries—*Arthur King, Fredericksburg, VA.*  
Bayside Brewers Oktoberfest, 63 entries—*Bryce van Denderen, Melbourne, Australia.*  
Chili and Beer Challenge at the Last Fling Pumpkin Sling, 13 entries—*Eric Kendra, Great Meadows, NJ.*  
Hoppy Halloween 16 - They're Coming!, 584 entries—*Michael Crane, Leawood, KS.*  
CiderDays Amateur Cider Competition, 23 entries—*Stephen Gale, Landing, NJ.*  
Oregon Brew Fall Classic, 364 entries—*John Oldendorf, Portland, OR.*

#### November 2013

- Nevada State Homebrew Championship, 185 entries—*Jason Hobbs, Reno, NV.*  
2013 Music City Brew Off, 440 entries—*Dave Dixon, Burlington, KY.*  
Skirmish in the Triad, 309 entries—*Mark Lowles, Greensboro, NC.*  
BarrelHouse Brewing Co. Pro-Am Homebrew Competition, 102 entries—*Eric Grimes, Atascadero, CA.*  
Novemberfest 2013, 178 entries—*George Stephens, Graham, WA.*  
6th Annual Monster Homebrew Competition, 51 entries—*Mark Schoppe, Austin, TX.*  
California State Homebrew Competition, 594 entries—*Kevin Teel, Santa Rosa, CA.*  
HopHead Fall Spiced Competition, 16 entries—*Greg Foley and David Carlberg, Boulder, CO.*  
SCH\*ABC 6, 324 entries—*Brian Connolly, Val Erlikham and Phil Ambrosino, Hainesport, NJ.*  
Beer for Boobs, 350 entries—*Larry Reuter, Akron, OH.*  
MALT Turkey Shoot, 184 entries—*Mel Thompson, Gaithersburg, MD.*  
Knickerbocker Battle of the Brews, 336 entries—*Karl Weiss, Wharton, NJ.*  
Land of the Muddy Waters, 375 entries—*Ben Stiltman.*  
Monster Mash, 83 entries—*Brad "Thile" Justice, Flowood, MS.*  
London and South East Craft Brewing Competition, 130 entries—*David Halse, London, UK.*  
I Concurso Norte Nordeste E Centro Oeste De Cerveja Artesanal, 13 entries—*José Frederico Hespanha Matt, Bahia.*  
Props and Hops Homebrew Competition, 74 entries—*Josh Kunkle, Palm Desert, CA.*  
FOAM Cup, 614 entries—*Mark Campbell, Imperial, MO.*  
Back to Our Brewing Roots Porter Competition, 18 entries—*Randy Swanson, San Francisco, CA.*  
HBOY IPA Competition, 111 entries—*Darrin Schauble, Phoenix, AZ.*

Butler Homebrew BASH, 180 entries—*Andy Weigel.*

Son of Brewzilla Homebrew Competition, 517 entries—*Andrew Mitchell, Mike Ontolchik, Willoughby, OH.*

Beer Quest Winter Ale, 21 entries—*Brian Wieser, Lincoln, NE.*

The Winnipeg Brew Bombers Present: The Half Pints Pro-Am Brew Challenge, 407 entries—*Dean Kelly, Saskatoon, Saskatchewan, Canada.*

#### December 2013

Big Spruce Brewing Home Brew Competition, 17 entries—*Tim Gregory, Halifax, Nova Scotia.*

Fugetaboutit 2013, 346 entries—*Jared Whalen & Chris McGreevy, Florence, KY.*

Nielsen-Massey Homebrew Challenge, 46 entries—*Brad Pauscha, Chicago, IL.*

7th Annual Virginia Beer Blitz, 465 entries—*Dan Diebler, Yorktown, VA.*

Beers and Beards, 25 entries—*Brian Constantino, Melville, NY.*

Humpy's Big Fish Homebrew Competition, 84 entries—*Jeff Shearer, Anchorage, AK.*

Monk Melee III, 119 entries—*Glenn and Keith Locke, Bensalem, PA.*

Biere de Rock, 133 entries—*Michael Crane, Leawood, KS.*



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## AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

For complete calendar, competition and judging information go to  
[www.HomebrewersAssociation.org/pages/competitions](http://www.HomebrewersAssociation.org/pages/competitions)



- March 1**  
**Brew Masters Competition**  
Florence, WI. Entry Deadline: 2/25/2014.  
[www.tricountyfermenters.com](http://www.tricountyfermenters.com)
- March 1**  
**Barley Legal 4**  
Towson, MD. Entry Deadline: 2/15/2014.  
[www.wootown.org/comp](http://www.wootown.org/comp)
- March 1**  
**Romancing the Beer 2nd Annual Homebrew Comp**  
Thousand Oaks, CA. Entry Deadline: 2/14/2014.  
[www.toaked.com/competition](http://www.toaked.com/competition)
- March 7**  
**Kona Brewers Festival Homebrew Competition**  
Kailua-Kona, HI. Entry Deadline: 2/21/2014.  
<https://sites.google.com/site/konabrewcontest>
- March 8**  
**Drunk Monk Challenge**  
Aurora, IL. Entry Deadline: 2/28/2014.  
[www.knaves.org/DMC/index.html](http://www.knaves.org/DMC/index.html)
- March 8**  
**Fermentationland Homebrew Competition**  
Augusta, ME. Entry Deadline: 2/22/2014.  
[www.malthonlineclub.org/competition](http://www.malthonlineclub.org/competition)
- March 8**  
**Louisiana Homebrew Club Competition**  
Baton Rouge, LA. Entry Deadline: 2/21/2014.  
[www.redstickbrewmasters.com/lhcc](http://www.redstickbrewmasters.com/lhcc)
- March 8**  
**Washington Mead & Cider Cup**  
Bellevue, WA. Entry Deadline: 2/28/2014.  
[wameadandcidercup.com](http://wameadandcidercup.com)
- March 8**  
**Bockfest Cincinnati 2014**  
Cincinnati, OH. Entry Deadline: 2/21/2014.  
[bockfest.brewcomp.com](http://bockfest.brewcomp.com)
- March 9**  
**Brew Hut Annual Homebrew Competition**  
Aurora, CO. Entry Deadline: 2/22/2014.  
[thebrewhut.brewcomp.com](http://thebrewhut.brewcomp.com)
- March 13**  
**Garrison's Ultimate Home Brew**  
Halifax, NS, Canada. Entry Deadline: 2/20/2014.
- March 14**  
**Beans & Brews**  
Elizabethtown, PA.  
[www.marketstreetib.com/beans-and-brews](http://www.marketstreetib.com/beans-and-brews)
- March 15**  
**World Cup of Beer**  
Oakland, CA. Entry Deadline: 2/12/2014.  
[www.worldcupofbeer.com](http://www.worldcupofbeer.com)
- March 15**  
**Márciusi sörforradalom**  
Budapest, Hungary. Entry Deadline: 3/1/2014.  
[www.elsosor.hu](http://www.elsosor.hu)
- March 15**  
**Hudson Valley Homebrewers 24th Annual Homebrew Competition**  
Poughkeepsie, NY. Entry Deadline: 3/8/2014.  
[hvhomebrewers.com](http://hvhomebrewers.com)
- March 15**  
**Belgian Beertest**  
Coldstream, Victoria, Australia. Entry Deadline: 3/15/2014.
- March 15**  
**Blarney Brew Off**  
Lees Summit, MO. Entry Deadline: 2/24/2014.  
[grains-taps.myshopify.com/pages/blarney-brew-off](http://grains-taps.myshopify.com/pages/blarney-brew-off)
- March 22**  
**2014 Peak-to-Peak ProAm**  
Longmont, CO. Entry Deadline: 3/14/2014. [www.indianapeaksalers.org/index.php/mpeak-to-peak-proam](http://www.indianapeaksalers.org/index.php/mpeak-to-peak-proam)
- March 22**  
**Barley Legal Bocks & Other Lagers**  
Maple Shade, NJ. Entry Deadline: 3/15/2014.  
[www.barylegalhomebrewers.com/page/2014-lager-competition](http://www.barylegalhomebrewers.com/page/2014-lager-competition)
- March 22**  
**2014 SNAFU Winterfest**  
Henderson, NV. Entry Deadline: 3/14/2014.  
[snafubrew.com](http://snafubrew.com)
- March 22**  
**23rd Annual Charlie Orr Memorial Chicago Cup Challenge**  
Crest Hill, IL. Entry Deadline: 3/8/2014.  
[www.bossbeer.org](http://www.bossbeer.org)
- March 22**  
**The Coconut Cup**  
Miami, FL. Entry Deadline: 2/28/2014.  
[miami-homebrew.org/competitions/coconut-cup/](http://miami-homebrew.org/competitions/coconut-cup/)
- March 23**  
**Battle of the Brews Craft Cup Homebrew Competition**  
Santa Rosa, CA. Entry Deadline: 3/1/2014.  
[www.sonomabeerocrats.com/pages/2014\\_Battle\\_of\\_the\\_Brews\\_Homebrew\\_Competition](http://www.sonomabeerocrats.com/pages/2014_Battle_of_the_Brews_Homebrew_Competition)
- March 28**  
**The Western NY Homebrew Competition 'Amber Waves of Grain'**  
Buffalo/Niagara Falls, NY. Entry Deadline: 3/14/2014. [niagarabrewers.org](http://niagarabrewers.org)
- March 28**  
**AHA National Homebrew Competition 1st Round**  
Kansas City, MO. Entry Deadline: 3/17/2014.  
[www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- March 28**  
**AHA National Homebrew Competition**  
Philadelphia, PA. Entry Deadline: 3/17/2014. [www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- March 29**  
**DC HomeBrewers Club Cherry Blossom Competition**  
Washington, DC. Entry Deadline: 3/15/2014.  
[www.dchbcompetition.com](http://www.dchbcompetition.com)
- March 29**  
**IBU Open**  
Des Moines, IA. Entry Deadline: 3/22/2014. [www.ibuopen.com](http://ibuopen.com)
- March 29**  
**IBU Spring Competition**  
Spokane, WA. Entry Deadline: 3/19/2014.  
[www.inlandbrewersunite.com](http://www.inlandbrewersunite.com) or  
[www.facebook.com/groups/inlandbrewersunite/](http://www.facebook.com/groups/inlandbrewersunite/)
- March 29**  
**The Brew-seum Battle of the Brew**  
McAllen, TX. [www.brew-seum.com](http://www.brew-seum.com)
- April 4**  
**AHA National Homebrew Competition 1st Round**  
San Diego, CA. Entry Deadline: 3/17/2014.  
[www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- April 4**  
**AHA National Homebrew Competition 1st Round**  
Seattle, WA. Entry Deadline: 3/17/2014.  
[www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- April 5**  
**4th Annual Ocean State Homebrew Competition**  
Providence, RI. Entry Deadline: 3/15/2014.  
[www.oshc.brewcomp.com](http://www.oshc.brewcomp.com)
- April 5**  
**Great Arizona Homebrew Competition**  
Buckeye, AZ. Entry Deadline: 3/29/2014.  
[www.brewarizona.org](http://www.brewarizona.org)
- April 5**  
**Champion of the Pint**  
O'Fallon, MO. Entry Deadline: 3/28/2014.  
[www.garagebrewers.com/champion-of-the-pint/](http://www.garagebrewers.com/champion-of-the-pint/)
- April 11**  
**AHA National Homebrew Competition 1st Round**  
Saint Paul, MN. Entry Deadline: 3/17/2014.  
[www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- April 11**  
**AHA National Homebrew Competition 1st Round**  
Arvada, CO. Entry Deadline: 3/17/2014.  
[www.homebrewersassociation.org](http://www.homebrewersassociation.org)
- April 12**  
**Capitol Brewers 9th Annual Homebrewers Classic**  
Salem, OR. Entry Deadline: 3/28/2014.
- April 26**  
**18th Annual Cascade Brewers Cup**  
Seattle, WA. Entry Deadline: 4/19/2014.  
[www.cascadebrewersguild.com](http://www.cascadebrewersguild.com)

### AHA SPECIAL EVENTS

Visit the Events section of [HomebrewersAssociation.org](http://HomebrewersAssociation.org) for more information.

- March 6**  
**AHA Rally – Allagash Brewing Co.**  
Portland, ME
- March 15**  
**AHA Rally – Stone Brewing Co.**  
Escondido, CA
- March 21-April 13**  
**National Homebrew Competition First Round Judging**
- March 23**  
**AHA Rally – New Holland Brewing Co.**  
Holland, MI
- March 29**  
**AHA Rally – Foothills Brewing Co.**  
Winston-Salem, NC
- April 26**  
**AHA Rally – Heretic Brewing Co.**  
Fairfield, CA
- April 27**  
**AHA Rally – Green Dragon & Buckman Botanical Brewery**  
Portland, OR
- May 3**  
**Big Brew/National Homebrew Day**
- June 12-14**  
**National Homebrewers Conference**  
Grand Rapids, Mich.

# COMMERCIAL CALIBRATION

**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 widely available commercial beers (or meads or ciders) using the BJCP scoresheet. We invite you to download your own scoresheets at [www.bjcp.org](http://www.bjcp.org), pick up a bottle of each of the beverages and judge along with them in our Commercial Calibration.**



**A**s we continue to work our way through the BJCP Style Guidelines, two English milds (Category 11A) were sent to our judges for this issue.

First up was NOLA Brown Ale from NOLA Brewing Co. in New Orleans, La. The beer was one of the brewery's first two flagship ales, and is available year-round in 12-ounce cans and on draft.

NOLA Brown Ale is a light-bodied, full-flavored English dark mild ale with notes of chocolate, coffee, caramel, and nuts. It checks in at 3.9 percent ABV.

Fresh off a silver medal at the 2013 Great American Beer Festival is Brawler from Yards Brewing Co. in Philadelphia. Checking in at 4.2 percent ABV, the malt-forward, ruby-colored ale features flavors of freshly baked bread and caramel that dominate the palate and aroma.

First brewed in 1998, it was re-introduced in 2008. The beer is available year-round in 12-ounce bottles and on draft. Suggested pairings from the brewery include margherita pizza and barbecue, as well as spicy foods.

Yards Brewing Co. refers to Brawler as “the most approachable of our ales.”

## ON THE WEB

**NOLA Brewing Co.**  
[www.nolabrewing.com](http://www.nolabrewing.com)

**Yards Brewing Co.**  
[www.yardsbrewing.com](http://www.yardsbrewing.com)

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

**Commercial Calibration**  
[HomebrewersAssociation.org/pages/zymurgy/commercial-calibration](http://HomebrewersAssociation.org/pages/zymurgy/commercial-calibration)

(Note: This is a Members Only area of the website)

**OUR EXPERT PANEL** includes David Houseman, a Grand Master IV judge and competition director for the BJCP from Chester Springs, Pa.; Beth Zangari, a Grand Master level judge from Placerville, Calif. and founding member of Hangtown Association of Zymurgy Enthusiasts (H.A.Z.E.); 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 VII judge, principal author of the 2004 BJCP Style Guidelines and president of the BJCP board who lives in Beavercreek, Ohio.

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# THE SCORES



NOLA Brown Ale—NOLA Brewing Co., New Orleans, La.  
BJCP Category: 11A English Mild

## THE JUDGES' SCORES FOR NOLA BROWN ALE



DAVE HOUSEMAN



BETH ZANGARI



SCOTT BICKHAM



GORDON STRONG

**Aroma:** Light chocolate malt with hints of toffee and roasted nuts. Low earthy hop aroma. No diacetyl. Light fruitiness from fermentation. No alcohol aroma. Low to medium vegetal notes of DMS. Good deal of aroma complexity for a 3.9-percent ABV beer. (9/12)

**Appearance:** Brown with light ruby highlights. Clear but some turbidity in late pour. Thick, rocky, long-lasting tan head. Moderate carbonation. (3/3)

**Flavor:** Chocolate malt and vegetal DMS notes up front with low hop bitterness and earthy flavor that balances. Low toffee and roasted nut flavor. A bit of chalky mineral presence. No diacetyl. Light yeast-derived fruity esters. Finishes just on the dry side of balanced. No alcohol in flavor. Aftertaste fades rapidly with memory of the chocolate malt. (15/20)

**Mouthfeel:** Thin body and mouthfeel. No alcohol warming. No astringency or lingering bitterness in mouthfeel. Well attenuated, dry, chalky mouthfeel. (3/5)

**Overall Impression:** A good mild. Very easy drinking. DMS is somewhat distracting and could be managed to improve further. Additional complexity can be achieved with additional accent malts and more body created with a higher mash temperature. A late pour brought out more yeasty notes. This flavorful canned beer would work well tailgating with a burger and fries. (7/10)

**Total Score:** (37/50)

**Aroma:** Initial lightly toasty malt, with a moderately strong caramel component. Hints of light roasted coffee play in the background. Raisin notes start in the distance, move to the front with a more plum-like fruitiness. No hop aroma. (8/12)

**Appearance:** Deep brown black with ruby highlights; when held to the light looks red-black. A loosely formed layer of tan foam forms, then fades to a mist of bubbles on the surface that leave a ring around the glass. Clarity is brilliant on the first pour; the end of the container was a bit cloudy. (2/3)

**Flavor:** Lightly caramel maltiness with low notes of raisins and sweet, tree-ripened plums that give depth. A light coffee-like roast note follows mid-palate, but fades in the finish. No hop flavor, but a light hop bitterness accentuates a clean, fairly dry finish. The hints of roast coffee reemerge briefly in the post finish for a complex, well-balanced, malt-oriented beverage. (17/20)

**Mouthfeel:** Light bodied with firm carbonation that borders on spritzy. No alcohol warmth; not creamy, but not watery either. The finish has a hint of roast astringency that provides a crispness. (4/5)

**Overall Impression:** A showcase for malt complexity without being heavy or sweet. Complexity and character seem to come more from the malt than from the yeast character, which is actually rather cleaner than I expected. Almost lager like, as though fermented at very cool ale temps. Extremely quaffable, this is a wonderful beer to have by pints on afternoons or evenings you don't want to end. (8/10)

**Total Score:** (39/50)

**Aroma:** Nutty and toasted malts come through with a slightly acrid graininess floating underneath. Light roasted notes of chocolate and coffee. Definitely malt focused, with light apple esters and a hint of pear-like fruitiness. No hop character is evident, nor is diacetyl. (9/12)

**Appearance:** Dark brown in color with mahogany notes. Pristine clarity. Off-white head with tightly beaded bubbles that collapse very slowly. (3/3)

**Flavor:** A very smooth beer with a good malt complexity and balance. The malt has lightly roasted notes, chocolate, and a hint of treacle. The grainy notes add a little tang to the finish. Low to moderate fruity esters, mainly pear but also a little green apple that does not seem to be acet-aldehyde. The finish is soft, with low hop bitterness and mineral dryness with a hint of sulfates. (15/20)

**Mouthfeel:** Good creaminess for a low gravity beer, with excellent conditioning and a low level of residual sugars. Very low astringency from roasted grains, but no alcohol as appropriate. (4/5)

**Overall Impression:** A solid session beer with good malt complexity without being too big for style. The malt and hops are well-balanced, with neither one dominating the finish. A relatively clean beer with only a low level of light fruity esters. The main detractor was a little acidity in the finish that could come from the roasted malts or perhaps a little oxidation. (7/10)

**Total Score:** (38/50)

**Aroma:** Chocolate, toffee, caramel and nuts. Quite complex and malty-rich-sweet. Some toasty notes follow. No hops. Bare hint of fruit. All about malt complexity. The malt aroma is moderately strong, and has bready undertones. Clean, fresh, and inviting. (11/12)

**Appearance:** Medium brown color with mahogany highlights. Moderate-sized beige head with fair retention. Slight haze. (2/3)

**Flavor:** Odd, lightly metallic or iron-like flavor. Is this from the can? Initial chocolate-toffee flavor with caramel, toast, and nuts (like toasted hazelnuts) in the middle, and a light coffee-roast finish. Very interesting. Low bitterness. Off-dry finish. Low earthy hop flavor. Very little esters, seems pretty clean. Malty finish with roast and toffee flavors. Aftertaste of chocolate and toffee. (14/20)

**Mouthfeel:** Medium to medium-light body. Moderate carbonation, a bit much. No warming, creaminess or astringency. Just a hint of acidity, as from roasted malts. Seems like a low alcohol beer, but not watery or insipid. (4/5)

**Overall Impression:** Except for that metallic note, a really proper mild. The malt flavors are interesting; they change while you're drinking it. A touch over-carbonated, but otherwise sound. That metallic flavor was light, but didn't go away. Delicious malt character and balance. Quite sessionable. (7/10)

**Total Score:** (38/50)



## THE JUDGES' SCORES FOR YARDS BRAWLER



**Aroma:** Malt dominant with chocolate up front and hints of toffee and light roasted coffee-like notes. No hop aroma. No DMS. No diacetyl. Very low fruity fermentation esters. No alcohol aroma. Very clean and inviting. (10/12)

**Appearance:** Amber/brown color. Dense, thin, rocky, tan head with excellent retention. Brilliant clarity. Moderate carbonation. (3/3)

**Flavor:** Rich maltiness with chocolate, caramel, and toasted malt character. Low earthy hop notes. Medium hop bitterness balances the malts. Finishes just on the sweet side of balanced. Hint of yeast-derived fruitiness. No DMS. No diacetyl. No alcohol flavor. (17/20)

**Mouthfeel:** Smooth, creamy mouthfeel with medium-light body. No alcohol warming. Dry mouthfeel without astringency. Bit of lingering bitterness in finish. (5/5)

**Overall Impression:** Very tasty and complex, malt-forward English mild, true to style. Lower gravity/alcohol beer but retained the flavor, body, and mouthfeel of a bigger beer. A little more hop flavor, while not required, would add to complexity. Great beer to complement a steak with mushroom sauce. (8/10)

**Total Score:** (43/50)



**Aroma:** Toasty caramel maltiness dominates a very clean fermentation character. No hop aroma. As the sample warms a bit, the malt character grows richer and more complex, with strong notes of dried prunes and brown sugar. (8/12)

**Appearance:** Burnished copper, brilliantly clear. A light foam of variously sized bubbles forms, but falls quickly to a thin layer on the surface, with a thick ring that clings to the sides of the glass. (3/3)

**Flavor:** Rich caramel maltiness dominates up front while coffee and toast play in the background. A bare hint of fruitiness (plum) emerges, then fades to clean fermentation character. No diacetyl. No hop flavor, though a low bitterness balances the finish. Malt character follows briefly with a low brown sugar sweetness, then a light, clean finish. A hint of plum returns briefly post-finish, then disappears. (17/20)

**Mouthfeel:** Light bodied with a rather spritzy carbonation, for a bit of carbonic bite. Low alcohol emerges toward the end, and lingers lightly with a bare hint of roast astringency. (4/5)

**Overall Impression:** The depth of malt is amazingly complex for such a light bodied and low alcohol beer. Surprisingly rich yet light and extremely drinkable. Malty character is quite British, though the carbonation is a bit more lively than a draught or cask example. I would love to have a draught pint (or two) with a ploughman's lunch and a good book to read. (8/10)

**Total Score:** (40/50)



**Aroma:** Malt forward, with toasted breadcrumbs and a pleasant nuttiness, along with some biscuit and a hint of toffee. Very nice complexity for a small beer. I also pick up some graininess similar to freshly cracked pale malt. Fermentation esters are low to moderate, with notes of pear and strawberries. (11/12)

**Appearance:** Medium brown in color with excellent clarity. The white crown of foam stands up well and leaves some lace on the inside of the glass. The texture of the head is uniform except for a few larger bubbles near the glass. (3/3)

**Flavor:** The malt provides a surprisingly solid backbone that leans a little to the sweet side, with restrained hop bitterness. Nutty, toasty, and light chocolate notes with a little toffee. A little roast, but not enough to inhibit the finish from being soft. No hop aroma apparent, and the low ester level adds some fruity complexity that complements the malt. The only negative is a little sour graininess in the finish. (17/20)

**Mouthfeel:** Low to moderate creaminess in spite of the light body, thanks to very good conditioning and moderate carbonation. A slight astringency correlates with the husky, somewhat grainy flavor noted above. No alcohol is evident as per the style guidelines. (4/5)

**Overall Impression:** A very nice, well-drafted session beer that fits solidly in the mild style. The malt complexity is sufficient to carry the flavor and aroma without being too sweet and one-dimensional. A little more hop bitterness might further improve the balance without impacting the smoothness. This is a great session beer that was a pleasure to judge. (8/10)

**Total Score:** (43/50)



**Aroma:** Toasty-nutty malt sweetness with hints of milk chocolate and bread crusts. Lightly fruity. Initial whiff of sulfur went away quickly. Settles into a mellow toasty-bready vibe. Impression of dryness, a bit dusty. (9/12)

**Appearance:** Dark reddish-copper color, almost brown. Tall, light tan head with tight bubbles, persisted well. Very clear. (3/3)

**Flavor:** Nutty-biscuity malt, lots of toast, bread crusts, and crackers. Medium bitterness with a relatively dry finish. Light impression of staleness—the flavors don't quite pop, and it seems a little papery. Faint hop flavor, a little earthy. Low fruity esters. Fairly clean. Hop flavor grows slightly as it warms, and is present in the aftertaste along with the toasty malt. (14/20)

**Mouthfeel:** Medium-full body. Medium-high carbonation—the Brits would say this is "gassy." Not really creamy, just kind of dextrinous. No astringency or alcohol heat. (4/5)

**Overall Impression:** Might be showing early signs of oxidation. Has more of a feel of an English brown ale than a mild, although with a fuller body. A bit big for a mild too. A toasty version of a mild, might do better as an 11c Northern English Brown Ale. Very British-tasting, but a touch bitter. Seems quite well-made, though. (7/10)

**Total Score:** (37/50)

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by Charlie Papazian



# A Nation of Brewers

In the River North area of Denver, Colo. lives the dream come true of three founding “badass” entrepreneurs, brothers Branden and Chad Miller along with Chad’s wife, Carissa. The Black Shirt Brewing Co. has its roots in homebrewing and garage nanobrewing, and after a long journey opened at its current location in 2009.

The building the trio purchased was a rundown, decrepit small business dwelling with seemingly no hope of recovery in a rough neighborhood. With very little money and lots of sweat equity, they worked day jobs and doubled their time nightly gutting and reconstructing the building. It was an unrelenting period of a do-it-yourself, build-it-yourself construction project demanding maximum resourcefulness. After nearly four years, they recently scaled up with a new 15-barrel system brewing beer for their

neighborhood. It has become a destination for musicians and artists who perform and enjoy their craft beer.

Behind the brewery a Light Rail station is being developed—tracks that will bring people from downtown Denver to their neighborhood. A convenient, seemingly made-to-order Light Rail walkway will drop travelers at the doorsteps of the Black Shirt Brewing Co. The brewery will be remembered as an anchor for the resurrection of this district. *Branden and Chad started out as homebrewers.*

Last September I visited Quarry Brewing in Butte, Mont. It opened in 2007 on a quiet main street of economically depressed Butte. Brewery entrepreneurs Chuck and Lyza Schnabel bought an abandoned heritage-style three-story hotel for \$75,000. First a brewery and tap room were established on the lower level

(below street level from the front, but opens up to a back alley at street level). Renovations continue. Baking equipment was bought and is now up and running. The opening day of the bakery brought a line of customers out the front door. A café is in the early stages of development. An entertainment and lounge area as well as a planned bed and breakfast on the upper floors are in progress.

When a porn shop across the street had its lease terminated, Chuck and Lyza purchased the building and lot for \$10,000. Plans for more parking and a restaurant are anticipated. It seems to be the beginning of a brighter future for the area. *Chuck started out as a homebrewer.*

While in Butte I had the privilege of having a beer with Jim Devine, brewer, owner, and founder of the Beaver Creek Brewery in Wibaux, Mont. (I need to clarify that I haven’t been to the brewery yet, but it is high on my list.) Wibaux is a town of a few hundred people, three or four hours from the nearest airport. It’s located in eastern Montana, 10 miles from the North Dakota border.

Devine is a big man with big ideas in a small town. He renovated a long-time unused building and established his brewery in 2008. It’s now a center point of the community, attracting quality performances from musicians who pass through on their travels across America. The nearby movie theatre hadn’t shown a film since the 1950s. The cinema has been renovated as the Historic Gem Theatre and Pub, hosting beer drinking and entertainment. Neighboring worn-down office space has been getting a facelift to add brilliance to this tiny town



Charlie with Jim Devine of Beaver Creek Brewery in Wibaux, Mont.

# Duck Slippers Session Helles

ALL GRAIN RECIPE

## INGREDIENTS FOR 5.5 U.S. GALLONS (21 L)

6.5 lb	(3 kg) floor-malted Bohemian pale malt
12.0 oz	(340 g) aromatic malt
12.0 oz	(340 g) Gambrinus honey malt
4.0 oz	(113 g) German sauer (acidulated) malt
0.5 oz	(14 g) Mt. Hood hops, 5% a.a. (2.5 HBU/70 MBU), 60 min
0.5 oz	(14 g) German Hallertauer hops, 4.3% a.a. (2.2 HBU/61 MBU), 60 min
0.63 oz	(18 g) German Saphir pellet hops, 1 min
0.5 oz	(14 g) German Saphir pellet hops, dry hop

0.25 oz	(7 g) Crystal pellet hops, dry hop
0.25 tsp	(1 g) powdered Irish moss
	German or Bavarian type lager yeast
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

**Target Original Gravity:** 1.040 (10 B)

**Target Extraction Efficiency:** 75%

**Approximate Final Gravity:** 1.010 (2.5 B)

**IBUs:** about 21

**Approximate color:** 6 SRM (12 EBC)

**Alcohol:** 4% by volume

## DIRECTIONS

A step infusion mash is employed to mash the grains. Add 8 quarts (7.6 l) of 140° F (60° C) water to the crushed grain, stir, stabilize, and hold the temperature at 132° F (56° C) for 30 minutes. Add 4 quarts (3.8 l) of boiling water or add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Raise temperature to 167° F (75° C), lauter and sparge with 3.5 gallons (13.25 l) of 170° F (77° C) water. Collect about 6 gallons (22.71 l) of runoff. Add 60-minute hops and bring to a full and vigorous boil.

The total boil time will be 60 minutes. When 10 minutes remain add the Irish moss. When 1 minute remains add the 1-minute hops. After a total wort boil of 60 minutes, turn off the heat and place the pot (with cover on) in a running cold-water bath for 30 minutes. Continue to chill in the immersion or use other methods to chill your wort. Strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5.5 gallons (21 l) with additional cold water if necessary. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at temperatures of about 55° F (12.5° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. If you have the capability "lager" the beer at temperatures between 35-45° F (1.5-7° C) for 3-6 weeks. Prime with sugar and bottle or keg when complete.

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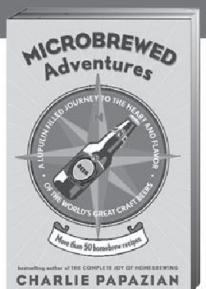
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# Duck Slippers Session Helles

## MASH/EXTRACT RECIPE

### INGREDIENTS

for 5.5 U.S. gallons (21 L)

<b>4.8 lb</b>	(2.18 kg) very light malt extract syrup or 4 lb (1.8 kg) very light DRIED malt extract
<b>12.0 oz</b>	(340 g) aromatic malt
<b>12.0 oz</b>	(340 g) Gambrinus honey malt
<b>4.0 oz</b>	(113 g) German sauer (acidulated) malt
<b>0.5 oz</b>	(14 g) Mt. Hood hops, 5% a.a. (2.5 HBU/70 MBU), 60 min
<b>0.5 oz</b>	(14 g) German Hallertauer hops, 4.3% a.a. (2.2 HBU/61 MBU), 60 min
<b>0.63 oz</b>	(18 g) German Saphir pellet hops, 1 min
<b>0.5 oz</b>	(14 g) German Saphir pellet hops, dry hop
<b>0.25 oz</b>	(7 g) Crystal pellet hops, dry hop
<b>0.25 tsp</b>	(1 g) powdered Irish moss
German or Bavarian type lager yeast	
<b>0.75 cup</b>	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

**Target Original Gravity:** 1.040 (10 B)

**Target Extraction Efficiency:** 75%

**Approximate Final Gravity:** 1.010 (2.5 B)

**IBUs:** about 21

**Approximate color:** 6 SRM (12 EBC)

**Alcohol:** 4% by volume

### DIRECTIONS

Heat 2 quarts (1.9 l) water to 172° F (77.5° C) and add crushed grains. Stir well to distribute heat. Temperature should stabilize at about 155° F (68° C). Wrap a towel around the pot and set aside for about 45 minutes. Have a homebrew.

After 45 minutes add heat to the mini-mash and raise the temperature to 167° F (75° C). Pass the liquid and grains into a strainer and rinse with 170° F (77° C) water. Discard the grains.

Add more water to the sweet extract you have just produced, bringing the volume up to about 2.5 gallons (9.5 l). Add malt extract and 60 minute hops and bring to a boil. The total boil time will be 60 minutes. When 10 minutes remain add Irish moss. When 1 minute remains add the 1-minute hops. After a total wort boil of 60 minutes turn off the heat. Immerse the covered pot of wort in a cold water bath and let sit for 30 minutes or the time it takes to have a couple of homebrews.

Strain out and sparge hops and direct the hot wort into a sanitized fermenter to which 2.5 gallons (9.5 l) of cold water has been added. If necessary add cold water to achieve a 5.5-gallon (21 l) batch size. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Once visible signs of fermentation are evident, ferment at temperatures of about 55° F (12.5° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and add the hop pellets for dry hopping. If you have the capability "lager" the beer at temperatures between 35-45° F (1.5-7° C) for 3-6 weeks. Prime with sugar and bottle or keg when complete.

that replicates what can happen on Main Street in Anywhere, America. Jim started out as a homebrewer.

### The Face of Things to Come

In the 1980s, homebrewing was an imaginary idea for nearly all Americans. It was something your grandfather (or perhaps your great-grandfather) did in the bathtub with results that often resulted in exploding bottles. The image of homebrewing was so bad there were some in the fledgling homebrew community who wanted to do away with the term "homebrewing" altogether because of the negative connotations associated with the quality. My, oh my, how things have changed. American homebrewers now wear their badge proudly, knowing they make some of the best beer in the world and continue to be a creative and quality-

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driven force for the transition American beer continues to go through.

Let's take a look at some of the statistics that define American beer and brewing.

- 1.25 million American homebrewers will brew beer in a given year.
- 250 million Americans are at least 18 years old. That's 5,000 homebrewers for every million adults; one for every 200 adults.
- Homebrewers produce about 2 million barrels of beer a year. That's 62 million gallons or 661 million 12-ounce

bottles or 27.6 million cases.

- Nationwide there are more than 2,700 breweries, with more than 1,600 in planning.
- The largest craft brewer produces about 2.4 million barrels of beer but is only about 1.2 percent of the total U.S. beer market.
- If you don't count the 50 top producing American craft brewers, the average annual production of a brewpub is 769 barrels (31 gallons = 1 U.S. barrel). The average annual production of a packaging brewery is 1,704 barrels.
- A Brewers Association survey last year

revealed that more than 40 percent of packaging breweries were less than three years old.

Amateur homebrewers and professional small and independent brewers are craft brewers. American craft brewers continue to grow. The reason for their growth and popularity is not only about the beer. New craft brewers continue to open across the United States in both established craft beer-centric metropolitan areas and in the smallest of rural communities. More than 2,700 small and independent American brewers are succeeding and will continue to succeed for years to come. Their success is not a simple measure of traditional beer industry values. There's more to understand than what the statistics reveal.

What is the future of beer in the USA? You have to be on the ground and you have to see it, drink it, listen to it, feel it, taste it, and live it—face to face. These kinds of things don't show up in reports, statistics, projections, surveys, power point presentations, or speeches at a podium.

Many new dynamics are relevant to the success of current and future American breweries, but one thing consistently matters. *Quality matters*. It's not only about quality beer, but quality of attitude and doing the right thing. There's plenty of passion that I'm seeing for doing so.

America's average craft brewer lives in a dimension that will continue to appeal to Main Street American beer drinkers who are not necessarily always seeking mainstream American beer.

Let's cut the shuck and jive and get on with a recipe.

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**Charlie Papazian is founder of the American Homebrewers Association, which celebrated its 35th birthday in December 2013.**

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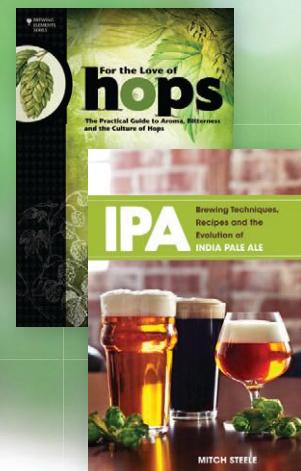


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# Mississippi Brewers' Retreat

**A**sheville, N.C. Portland, Ore. San Diego, Calif. Edwards, Miss.?

In the pantheon of craft beer destinations, Edwards will almost certainly not show up on any map. The small southern town known for the site of the final scene from the film "O Brother, Where Art Thou?" and a stopping point for Ulysses S. Grant on his way to capture Vicksburg has three convenience stores and no traffic lights. The beer selection is of the macro variety.

But on a warm Saturday in April 2013, Edwards became a beer destination with the 2nd annual Mississippi Homebrewers' Retreat, hosted by the Delta Brews homebrew club on a member's nine-acre plot of land. More than 60 people, including members of five Mississippi homebrew clubs, a Louisiana homebrew club, and commercial brewers converged on Edwards to set up campsites and tents and, of course, homebrew.

In its second year, the brewers' retreat grew to include 15 homebrew kegs, a special firkin donated by a regional brewer, and a large collection of wild ales, the likes of which most Mississippians have probably never seen. The retreat presented the first opportunity for the newly formed Mississippi Wild Ale Society to meet and host a sour and wild ale tasting. The group was formed in 2012 to promote discussion, tasting, and brewing of beers with non-Saccharomyces microbes in a state that only recently raised the ABV limit above 6 to 10.2 percent. In all, 35 sour and wild ales—even some brewed with wild Mississippi yeasts and bacteria—were available for quaffing, and all dregs were saved to be added to future beers.



The idea for the first retreat began during a conversation among club members when it was decided that Edwards would be a perfect site for an event to promote homebrew discussion, collaboration, and

fellowship in a state that is certainly not known as a beer mecca. Until March 2013, homebrewing in Mississippi had been technically illegal.

With the work of Raise Your Pints Mississippi, a grassroots organization that successfully lobbied for the increase in ABV in beer in 2012, and the American Homebrewers Association, a homebrewing bill passed the Mississippi legislature and was signed by Gov. Phil Bryant on March 18. The law took effect July 1, which was cause for celebration in itself.

In all, the Mississippi Brewers' Retreat was an opportunity to celebrate homebrewing at a laid-back festival that had no sponsors and was unsanctioned. There is no advertising for the retreat, just word of mouth and love of beer. The retreat is expected to be even bigger and better in 2014.

**Sean P. Murphy is a 25-year newspaper veteran who has been brewing beer at home for two years. He is a New York native.**

Photos courtesy of Nathan Harms (Delta Brews)

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