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Coolships, and Farewell

How cool would it be to have a coolship for brewing? Several professional brewers discussed their use of coolships in the Experimental Brewing Seminar at the Big Beers, Belgians and Barleywines Festival in Vail, Colo. in January.

Traditionally, a coolship is a shallow, open-top vessel used to cool wort. It can also be used for spontaneous, wild fermentations of beer.

Allagash Brewing Co. is considered to be among the first U.S. brewers to use a coolship in its brewery, starting in 2007. Allagash uses its coolship to both cool wort and to introduce wild yeasts and bacteria for spontaneous fermentation. Hot, unfermented wort is cooled overnight using outside air temperatures from open windows, and naturally occurring microflora in the air inoculates the beer. The next morning, the batch is transferred into French oak barrels for fermentation.

Allagash brewmaster Jason Perkins said the process is meant to mimic Belgian lambic production, but “we don’t use the word ‘lambic’ out of respect for Belgian brewers,” he said.

Allagash has several Coolship series beers in its offerings including Resurgam (a gueuze-style beer), Cerise, Red, and Balaton. Ghoulschip is a seasonal coolship offering that is not spontaneously fermented; instead, it goes into the coolship for cooling the wort only. The beer, brewed using shredded pumpkins (accomplished in a wood chipper), toasted pumpkin seeds, and molasses, spends Halloween night in the coolship. House yeast is then pitched as the brew goes into wine barrels for one to three years.

One of the challenges of using a coolship is outside air temperature. At Jester King Brewery in Austin, Texas, coolship brewing is done only in January and February,

when the temperature dips to 30° F overnight, according to brewery president Jeffrey Stuffings. Jester King’s coolship is equipped with a hop basket for the addition of aged hops, used in traditional lambic brewing. The brewery is installing a new, larger coolship that holds 30 barrels of beer.

At Trinity Brewing Co. in Colorado Springs, Colo., the coolship is on casters to be able to move it around in the brewery. President Jason Yester cited other configurations of coolships including a double-stacked one at Drie Fonteinen in Belgium, and one on top of the roof at Former Future Brewing Co. in Denver.

Prairie Artisan Ales in Oklahoma has been playing around with its coolship, manufactured in Wisconsin. Last year, the brewery released Coolship Truck, a collaboration with Evil Twin Brewing that was spontaneously fermented in a makeshift coolship—in the back of a pickup truck.

“We take a redneck approach to this process and are less concerned about the technical aspects, but we’ll probably get more serious about it,” said brewmaster Chase Healey.

In other news, this is my final issue at the helm of *Zymurgy*. After 10 years, I am turning over the reins to Dave Carpenter, a frequent contributor and longtime AHA member, so I can focus on my duties as editor-in-chief of *The New Brewer*, *Zymurgy*’s sister publication for the professional craft brewing industry. (For more on Dave, see From the Glass on page 7). It’s been a privilege and a pleasure editing *Zymurgy*, and I raise a glass to you.

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



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Mash Tun

Like most homebrewers, we started brewing in converted orange coolers, but our obsession with everything stainless steel had us cracking some beers, and sketching on napkins once again. The result is this beauty; a foam insulated double-walled stainless steel mash tun, available in 10 & 20 gallon versions with all the bells and whistles!



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(zī'mər jē) n: the art and science of fermentation, as in brewing.

Vol. 39 * No. 2 | March/April 2016

zymurgy®

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Find more homebrewing recipes on our website @ HomebrewersAssociation.org/homebrew-recipes

>> GET THERE!

BEER CAMP ACROSS AMERICA

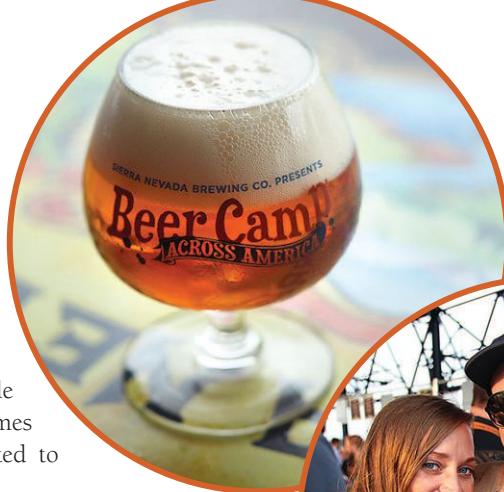
Sierra Nevada Brewing Co. will host its second Beer Camp Across America (BCAA) festival tour in June with stops in Tampa, Fla.; Seattle; Milwaukee; San Francisco; Boston; and Los Angeles. BCAA festivals offer craft beer fans the opportunity to sample specialty brews from hundreds of local and regional brewers while interacting with some of the most influential names in craft brewing. Every craft brewery is invited to pour at any of the six festival locations.

Dates include:

- May (TBA):** Special release events in Chico, Calif. and Mills River, N.C.
- June 4:** Tampa, Fla.
- June 11:** Seattle, Wash.
- June 11:** Milwaukee, Wis.
- June 18:** San Francisco, Calif.
- June 18:** Boston, Mass.
- June 25:** Los Angeles, Calif.

Each event will also celebrate and serve six limited edition collaboration beers, each one created by a different regional team of five breweries alongside Sierra Nevada.

More information and updates are available at beercamp.sierranevada.com.



March 5

Philly Craft Beer Festival

Philadelphia, PA

phillycraftbeefest.com

March 12

Kona Brewers Festival

Kailua-Kona, HI

konabrewersfestival.com

March 12

Northern Lights Rare Beer Fest

St. Paul, MN

northernlightsrarebeefest.com

April 1-2

Beer, Bourbon & BBQ Festival

Timonium, MD

beerandbourbon.com

April 2

Spring Craft Beer Festival

Elmont, NY

springcraftbeefestival.com

April 10

Classic City Brewfest

Athens, GA

classiccitybrew.com/brewfest.html

April 22-24

SweetWater 420 Fest

Atlanta, GA

sweetwater420fest.com

April 23

Missouri Beer Fest

Columbia, MO

missouribeerfestival.com

For more craft brewing events, go to CraftBeer.com

>> BEER QUOTE

"I believe every person has at least one great beer in them. They just need a fearless brewer like me to coax it out of them."

—Dogfish Head's Sam Calagione
on his web series, "That's Odd, Let's Drink It."

>> YOU'VE GOTTA DRINK THIS

BOULEVARD DOUBLE WIDE IPA

A double IPA that breaks the mold. Instead of blowing your head off with bitter hop craziness, this smooth IPA blends a great malt background with a healthy, citrusy hop kapow!

Reviewed by Stephen Wassinger, Pueblo, 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.



>> 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 14th year, we're asking you, "Who brews the best commercially available beers in the land?"

Voting is open to AHA members only. Just go to HomebrewersAssociation.org/zym-best-beers, log in, and type in your favorite beers. You can vote for both domestic and imported beers, but they must be available for purchase in the United States. Voting ends March 11. 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 it in a comments field (this is appreciated but not mandatory). We'll include some of your reviews in the July/August issue as well as in future installments of "You've Gotta Drink This" in Beeroscope.

Thanks for voting!



>> GREAT PRODUCT

WHAT'S NEW FROM BRIESS MALT & INGREDIENTS CO. SINGLE-MALT EXTRACTS

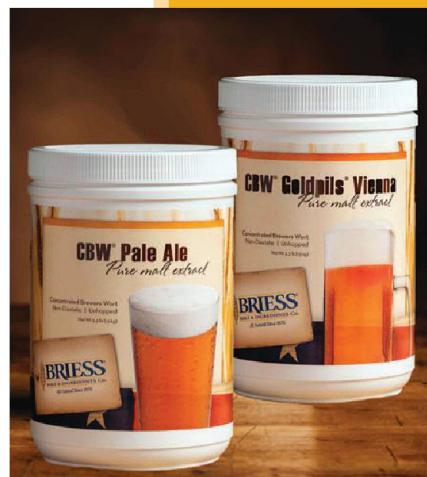
Briess added two new CBW® (Concentrated Brewers Wort) malt extracts to its portfolio, each produced from a single malt:

- CBW® Goldpils Vienna malt extract (6° L at 8° Plato)
- CBW® Pale Ale malt extract (6° L at 8° Plato)

These single-malt extracts make converting from extract to all-grain, or vice versa, easier, while giving the brewer total control.

Briess Goldpils® Vienna: Traditional German-style malt characterized by malty flavor with hints of biscuit. When formulating with either the extract or whole kernel malt, brewers should keep in mind that Goldpils® Vienna Malt is less sweet than Pale Ale Malt, and contributes less color than Munich Malt.

Briess Pale Ale: Briess Pale Ale Malt has a unique flavor profile that sets it apart from other versions of this malt offered to American craft brewers. Briess maltsters designed it to be a fully modified, high-extract, low-protein malt, not just a darker Brewers Malt. This required developing a proprietary malting recipe that involves careful monitoring of the kiln drying cycle



and specialized temperature rests. The result is a base malt with rich malt flavors and hints of biscuit and nuts.

Briess CBW® malt extracts are gently vacuum evaporated to maintain their rich, full flavor and lessen color development, and are produced using a multiple step infusion brewing process for high fermentability.

For more information visit

BrewingWithBriess.com or email
info@BrewingWithBriess.com.



>> GREAT RECIPE

BEER-CANDIED BACON

This recipe by Laura at Tide & Thyme (tideandthyme.com) will wow your brunch guests (if you can restrain yourself from eating all of it before they arrive). The sugary sweetness of the brown sugar glaze is just the right contrast for the hearty bacon.

INGREDIENTS

1 lb	(0.45 kg) thick-cut, high-quality bacon
1/2 cup	(118 g) brown sugar
1/4 cup + 2 Tbs	(89 mL) beer (such as Dogfish Head Chicory Stout)

DIRECTIONS

Preheat oven to 400° F (204° C). Combine brown sugar and beer in a small bowl, whisking well to form a thin syrup. Set aside.

Line a rimmed baking sheet with aluminum foil. Place a wire cooling rack on top. Place the pieces of bacon on top of the rack, overlapping if necessary. Place in oven and cook for 10 minutes.

Remove from oven and brush one side of the bacon with the beer syrup. Flip and coat the other side with the syrup as well. Return to oven and cook for 10 minutes. Remove from oven and repeat process until bacon is crispy and browned, and you've used all the glaze.

Cool on wire rack for at least 1 hour before serving.

For more great beer and food recipes, visit tideandthyme.com and CraftBeer.com.

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By Gary Glass



New Zymurgy Editor

Starting with the May/June 2016 issue of *Zymurgy*, the magazine will be under a new leader for the first time since outgoing editor-in-chief Jill Redding took the reins back in 2006 after a four-year stint as associate editor. Dave Carpenter, an accomplished homebrewer, longtime AHA member, and past contributor to *Zymurgy*, is taking on the position of editor of *Zymurgy* and AHA Special Projects. I know Dave is excited to get started in this new position, which has him not only editing the magazine, but also the AHA's websites and other print materials.

Thankfully, Jill is not leaving the Brewers Association, but rather transitioning to focus more on her role as editor-in-chief of *The New Brewer* magazine, the journal for our sister organization, the Brewers Association Professional Division. The past decade has seen tremendous growth in both commercial craft brewing and homebrewing in the United States, and the Brewers Association's publications *Zymurgy* and *The New Brewer* have understandably grown as well. We've finally reached the point where having one person running both magazines is no longer tenable. By separating the editor roles for the two magazines, we gain not only greater focus for each, but also editing expertise for our websites and other written documents.

Please join me with a toast to Jill's outstanding service to AHA members via her contributions to *Zymurgy* magazine and welcome Dave as *Zymurgy*'s new editor.

AHA Governing Committee Election

The AHA Governing Committee and its various subcommittees provide the guidance that determines the future course for



Zymurgy's new editor, Dave Carpenter.

your association. As such, the members of the Governing Committee play a critical role for the AHA.

This year, two of the 15 Governing Committee seats are up for election. Four candidates are vying for those seats. Ballots for the 2016 AHA Governing Committee election must be submitted online by March 31. I urge all AHA members to participate by casting their votes at HomebrewersAssociation.org. Candidate statements and ballots can be found under the Membership section and linked from the Governing Committee pages.

I'd like to thank Justin Crossley of The Brewing Network who is concluding his time on the AHA Governing Committee with the end of his second term this year.

With Justin's unique perspective and connections within the homebrewing community, he has made major contributions to the Governing Committee. Justin has been a tireless proponent of the AHA. Plus, The Brewing Network's participation in the AHA National Homebrewers Conference (Homebrew Con) over the past 10 years has helped the AHA introduce the event to a wider audience and grow the event from hundreds of attendees to thousands of attendees. Justin has also generously offered time on The Brewing Network to interview the Governing Committee candidates so members have a chance to get to know the candidates a little better before casting their votes.

Thank you for taking the time to vote in this year's Governing Committee election!

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The Maltose Falcons were the 2015 Radegast Club of the Year.

Radegast Club of the Year Award

Known unofficially as the “Awesome Club of Awesomeness” award, the Radegast Club of the Year Award looks to highlight what makes homebrew clubs awesome.

The deadline for submitting an entry in the third annual Radegast Club of the Year Award is quickly approaching. Entries must be submitted via the entry form on HomebrewersAssociation.org by March 31.

With your entry, tell us 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 for more details on this award and to submit an entry on behalf of your club. The entry form allows for uploads of documents, PowerPoint presentations, videos, or whatever you have to support your submission. Entries will be judged by members of the AHA Governing Committee.

The winner of the 2016 Radegast Club of the Year Award will be announced June 11 at the National Homebrewers Conference in Baltimore.



San Diego was the site of the 2015 National Homebrewers Conference.



JUNE 9-11
BALTIMORE

Homebrew Con 2016

Speaking of the National Homebrewers Conference, registration for Homebrew Con Baltimore, which is taking place June 9-11, opens March 8. Set in the beautiful Inner Harbor area of Baltimore, Homebrew Con will grant attendees access to hundreds of restaurants, beer bars, breweries, museums, the National Aquarium, and shopping in that part of town. Oriole Park at Camden Yards, where the Baltimore Orioles play, is a short walk from the Convention Center. The Orioles will be hosting the 2015 world champion Kansas City Royals June 6 to 8, so baseball fans getting into town a little early can check out a game. A commuter rail stop just a block from the Baltimore Convention Center offers transportation to and from the Baltimore airport and Washington, D.C. Just a few blocks from the Convention Center you can pick up a water taxi—a fun way to experience the Inner Harbor.

This year's conference includes a record 63 different seminars to choose from, covering a huge range of topics for every level of homebrewer. And of course there will be beer. The annual Welcome Reception will feature breweries from near and not-so-near. Homebrew from scores of clubs will be on tap during Friday's Club Night. We'll close things out with a beer-paired dinner and the National Homebrew Competition awards ceremony. Throughout Homebrew Con, you can visit the Homebrew Expo, where we'll have around 100 different vendors showcasing the latest and greatest in homebrew gadgetry, ingredients, and more.

Don't miss out! Space is limited, so be sure to register early.

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.

Gerry Lynch 1st-Category 18 NHC 2015



I went through 4 recipe variations, entered several local competitions and took in everyone's advice before I entered the final version of my NHC Gold medal winning Tripel to the National Homebrew Competition. The one thing that didn't change is my use of PBW and Star San throughout the entire process. My guarantee to a clean brewing process every time.

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Remembering Fred and Byron

Dear *Zymurgy*,

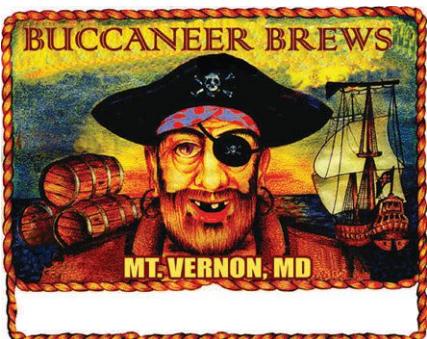
I was saddened to hear about the passing of Fred Eckhardt and Byron Burch (November/December 2015 *Zymurgy*). Fred and Byron were both instrumental in the early days of the homebrew revolution.

I met Fred in the early 80s at a homebrew conference in D.C. That Papazian guy must have told Fred about his adventures in the Library of Congress (where I worked), checking out the brewing books. That was when I could sneak anyone into the stacks. I also took Fred there and showed him his book, *A Treatise on Lager Beers*. He was quite happy to see it. We corresponded off and on, and I saw him at various homebrew events.

I met Byron at the 1991 Homebrewers Conference in Manchester, N.H., where Fred and I were both speakers. Byron and I had emailed earlier and exchanged some mead, so we tried each other's mead at the conference.

P.S. I have included the label I created for my various homebrewed products. The white space at the bottom is where I include what is in the bottle.

Ralph Bucca
Princess Anne, Md.
AHA Lifetime Member



Water Chemistry

Dear *Zymurgy*,

I have two reasons for writing this letter. First, I want to thank Charlie for his moving tribute to Fred Eckhardt and Byron Burch. Sometimes you have to wonder what beer and homebrewing would be like today if guys like Fred and Byron had not jumped in. I've been brewing for more than 26 years and the first book my wife gave me was Byron's book *Brewing Quality Beers*. Thanks Charlie, and thanks to Fred and Byron!

The second reason for writing is that I enjoyed the article on water chemistry in the same issue. It did help to simplify some things. However, on page 37, in Table 3: pH Corrections under Mash Water Treatment,

it says "add 0.5 mL/gal (0.13mL/L) of 88% lactic acid." Is there another way to measure this, such as teaspoons or grams, something simple? What would 0.5 mL/gallon be?

Great magazine! You folks do a lot of great work!

Dave Hrdlicka
Christiansburg, Va.

Article author Martin Brungard responds:

There is a simple conversion from teaspoons to milliliters. 1 tsp is 4.93 mL. Fortunately, most graduated medicine droppers have markings for both tsp and mL. Many brewers will find that working in milliliters is actually more accurate and easy to do.

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- ✓ Fits carboys & buckets
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Junior Brewer

Dear *Zymurgy*,

We live on Cape Cod and just this year became AHA members. Thanks for all the great things you do for this great hobby!

The photo (above) is of my three-year-old daughter, my junior brewer and the designated house “hop addition specialist.”

Sincerely,

Ryan Higgins
Mashpee, Mass.

Brew Menagerie

Dear *Zymurgy*,

I love seeing the brew dogs in *Zymurgy*. Unfortunately the sound of my propane burner scares my big bad shepherd Porter, so he usually steers clear when I get out the brewing equipment. Instead I’m including a picture of our chickens. No one loves brew day more than they do! I dump the spent grain in just after I’ve finished sparging. They will run and stand in the pile and eat like there’s no tomorrow—even though the grain is still steaming hot!

Here’s to brew dogs and chickens!

Travis Fisher

Honeoye Falls, N.Y.



Dear *Zymurgy*,

I've seen quite a few brew dogs in your magazine, but never a brew cat. This is Bullseye enjoying a homebrewed peach Berliner weisse while mashing a Citra IPA. He likes to keep me company while I brew, but he doesn't understand why I don't let him eat the hops.

Andrew Evans
San Diego, Calif.

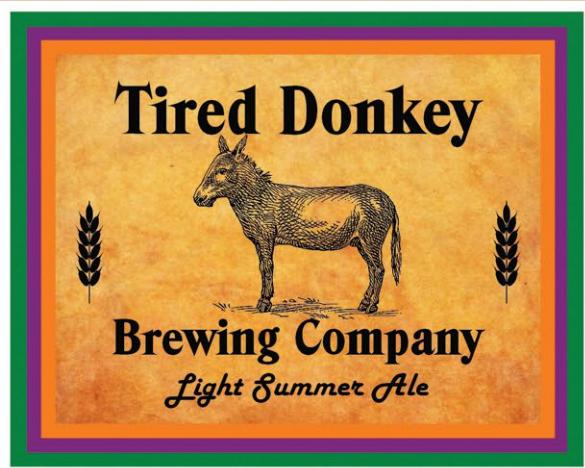
Send your Dear *Zymurgy* letters to zymurgy@brewersassociation.org. Letters may be edited for length and/or clarity.

Hey homebrewers! If you have a home-brew label that you'd like to submit for the Dear *Zymurgy* section, send it to magazine art director Jason Smith at jason@brewersassociation.org. 





READER-SUBMITTED HOMEBREW LABELS



Initially this beer label got quite a few jokes, as around my family and friends I am known as "the donkey and the wallet" since all I seem to do is schlep stuff around and hand out money to my kids and wife. So, in 2010 I created this beer label and for each batch I brew, I customize it with the brew name. The earthy parchment tones, bevel frame, and wheat stalks center the jackass well, and stand out nicely on a brown beer bottle.

The "Light Summer Ale" noted here recently won a silver medal at the local church's (St. Perpetua) Oktoberfest and carnival. It is a very simple recipe, consisting of dry malt extract, Willamette and Saaz pelletized hops, and Nottingham dry yeast. It has great clarity, good carbonation, and is light-bodied and refreshing, with just a little hoppy bite; perfect for hot days paired with grilled dishes of every sort. I've been brewing since 1996 when my wife got me my first homebrew kit.

Let's hope this label makes the next issue of *Zymurgy*; you may even hear the laughter from out here in California!

Happy brewing,

Chris Smith, Lafayette, Calif.



Here is a label that I recently made for a hard cider. I gave it an old-fashioned look with some iced tea bags that I had laying around and waterproofed with some seam seal. I took a few bottles to a company event and got a ton of compliments. It helped that the cider was tasty, too.

Brad Wyant, Kalamazoo, Mich. - Kalamazoo Libation Organization of Brewers (KLOB)



Premium Grade California Rice Malt

Add intriguing new malt flavors and colors
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Pale



Biscuit



Amber



Crystal



James' Brown



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[NorCal Brewing Solutions](http://www.norcalbrewingsolutions.com/)

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by Professor Surfeit



Homebrewed Headache



Dear Jonathan,

What a pain in the head! This is curious, indeed. You indicated that the only significant change you made was using a new mashing system. I don't know the exact details of Grainfather or any other system on the market, but I do know that if I were to come to enjoy any one of the great new systems out there, I would very carefully clean and sanitize the entire system before using. If there are welds involved, I'd also consider pickling or curing the stainless steel welds. That means "washing" with a mild acidic wash (such as citric acid or weak lactic acid) so that you compromise free iron ions that may migrate into your beer. Make sure all gaskets and hoses are food grade and of the highest quality for brewing beer, and that they aren't compromised by drastic swings in temperature and/or pH.

Dear Professor,

I recently brewed a pale ale utilizing my shiny new Grainfather system. Everything went flawlessly and I produced clearer wort and yielded a higher percentage of fermentable sugars from the grain than I ever did using my old cooler mash tun. After kegging and force carbonating this golden beauty, I found I had produced a delicious pale ale that was clean and crisp on the palate.

There was just one minor problem: the next morning, after only having one or two mugs, I would wake up with a headache that felt as if there was a pickaxe in my forehead. I know that improper cleaning and sanitation of the keg and lines can cause this, but I take cleaning and sanitation to a hospital operating room standard, utilizing Star San on everything that will come in contact with my beer. I have never had this issue with any other batches that I have kegged or bottled, so I am starting to rule out that the CO₂ is

contaminated—I used the same bottle on the batch just prior to the pale ale and had no headaches. What could have caused this?

My recipe consisted of 9 pounds (4.08 kg) two-row pale malt and 8 ounces (227 g) of crystal 60L. As for hops I used 1 ounce (28 g) of Chinook (0.75 oz/21 g, 60 min boil; 0.25 oz/7 g, 5 min boil) and dry hopped with 2 ounces (57 g) of Cascade. I mashed for 60 minutes at 154° F (68° C) and then did a mash out for 10 minutes at 167° F (75° C). I utilized Safale US-05 yeast in primary fermentation, which fermented at 69 to 70° F (20 to 21° C) for nine days, then into the secondary for nine days. These temperatures are ambient in my basement so there is some temperature spike, but nothing drastic.

Thanks for the help,
Jonathan Luzader
Spokane, Wash.

Meanwhile, my colleague Amahl Turczyn questions whether your fermentation temperatures could have spiked during high kräusen. If they did spike to 80 or 90 degrees, then the fermentation temperatures would produce higher alcohols called fusels and would likely cause headaches. Amahl comments, "I would suggest he try the recipe again with a thermometer strip on the carboy, and a way of lowering the fermenter temp—maybe just a cold water bath, a T-shirt draped over the carboy and in the water, and a fan. This old evaporative cooling trick saved many of my earlier batches from getting too hot in the primary."

So those are two aspects of your brewing experience to consider. If you can rule out a fermentation temperature spike and suspect an allergic reaction instead, you might substitute various parts of the system piece by piece to see if it makes any difference.

Stay calm,
The Professor, Hb.D.

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Revisiting Undercarbonation

Dear Professor,

Thank you for your response to Bill Bartman's letter about the lack of carbonation in his Russian imperial stout (November/December 2015 Zymurgy). It provided a thorough explanation of ensuring yeast health at priming time. But shouldn't a diagnosis also include the basics? Improper bottle conditioning plagues homebrewers and commercial brewers alike. Success depends on:

- Accurate measurement of volume—not as easy as it would seem.
- Accurate measurement of finished gravity for the record.
- Accurate input for temperature of green beer. In most calculators, the temperature defines assumed residual CO₂. This temperature should be based on the highest temperature reached during fermentation, not the temperature of the green beer at bottling time. However, if you added fruit, cold crashed, had extended aging, or aged in a barrel, it is much harder to assign an accurate temperature. That takes trial and error, and knowing your beer well.
- Correct amount of priming sugar, measured by weight, based on measurements above, kept in suspension during bottling.
- Following all of your November/December instructions about using the right selection, amount, and preparation of healthy yeast.
- Storing the freshly primed bottled beer at the correct temperature. This is crucial. High gravity Belgian- and American-style strong ales should be stored for four to eight weeks at 68 to 74° F (20 to 23° C) to ensure thorough carbonation. Possibly, bottles need to be rotated to ensure even heat. Overly low temps for conditioning are one of the main causes of undercarbonated beer among brewers I know.

Finally, Bill could also partially diagnose the cause of undercarbonation in his bottled beer by uncapping and taking a gravity reading. If the gravity is above what it was at bottling time, then the sugar was not consumed by yeast and he needs to re-yeast as per your instructions. If the gravity is the same, then re-fermentation did not occur because there was not enough sugar added.

Sincerely,
Karen Palcho
Berks County, Pa.

Dear Karen,
What do I think? I think you're onto something!

Wisened up,
The Professor, Hb.D.

Send your questions to professor@brewersassociation.org.

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By Amahl Turczyn

British Golden Ale

When I first tried Hop Back Brewery's Summer Lightning back in the early 90s, I was amazed at how different it was from the British bitter I had come to cherish during my college days in London. This was a different beast altogether: very pale yellow with lots of snowy, steadfast froth; voluminous, resinous hop aromatics of hay and marmalade; full hop flavor but no caramel, biscuit, or toffee to the malt component; and a dry, bracing finish with a healthy bitterness. Looking back at that first sip, it strikes me that Summer Lightning could easily be the forefather of the San Diego/West Coast IPA style—it was a beer brewed so light and dry that even unhopped it would demonstrate a crisp balance. Yet hops were the main point, and nothing in the 100-percent pale malt bill was allowed to stand in their way—no crystal malt, no high-kilned malts, no specialties of any kind.

It was simplicity itself, brewed along the lines of a Single Malt and Single Hop (SMaSH) beer, to show the quality and freshness of the best hops available. And as with American light lager, this minimalist approach meant there was no place to hide defects; hops had to be at their best because they were the focal point. In the case of Summer Lightning, the classic East Kent Golding hops were the star, but as this golden ale style has caught on in popularity, largely inspired by Hop Back's perennial favorite along with Exmoor Gold brewed in Taunton, Somerset, breweries have seen fit to take liberties with the showcase hop—many English brewers now choose citrus-forward American varieties. Hop Back is said to use Challenger to bitter the draft version of the beer, with E.K. Golding for flavor and aroma; for the bottled version, it's E.K. Golding only.



Even though the aforementioned forefathers of the style were first released in the 1980s, the popularity of British golden ale in the UK has made some astonishing gains in just the past few years. According to some sources, demand for the style in its native country increased some 70 percent from 2012 to 2014. In the 80s, as now, the idea was to win over lager drinkers with a light, refreshing beer that still retained real ale character; that appears to be a strategy that's working again.

Born of small craft breweries, the style has since its inception continued to be the purview of the little guys trying to make their mark in a world of mega lager conglomerates, but recently, the bigger fish are beginning to take notice. Thwaites Wainwright, Greene King Old Golden Hen, and Harviestoun Bitter & Twisted are among the most popular British golden ales currently, and now even Guinness has launched Guinness Golden Ale.

So what of British golden ale (also known as summer ale, golden bitter, and golden blonde) in North America? These are certainly not beers to be confused with American blonde ales, which have a characteristic sweet, light caramel malt backbone, to which hops are added casually, almost as an afterthought. American pale ale bears a certain resemblance, except that it often features an overt caramel component. No, the American stylistic equivalent would have to be a West Coast session IPA. Needless to say, this style has gained more than a bit of attention on its own in the same two- to three-year period—it's hard to see this as a coincidence.

Despite its lightness and drinkability, the style as presented by Hop Back is quite a bit stronger than your average best bitter or even special bitter. Its strength ranges from 1.048, the topmost allowable gravity for BJCP Category 11B Best Bitter, to 1.053, well into 11C Strong Bitter territo-

Summer in Salisbury

BRITISH GOLDEN ALE

INGREDIENTS for 5.5 U.S. gallons (20.82 L)

10.75 lb	(4.88 kg) Optic pale malt (100%)
1.0 oz	(28 g) Challenger pellets, 8.1% a.a. (60 min)
1.0 oz	(28 g) East Kent Golding pellets, 5% a.a. (15 min)
1.0 oz	(28 g) East Kent Golding pellets, 5% a.a. (10 min)
2.0 oz	(56 g) East Kent Golding pellets, 5% a.a. (steep 15 min)

White Labs Dry English, London III, or California Ale yeast

RO water treated with 1g/gallon calcium sulfate

Original Gravity: 1.053 (13° P)

Finishing Gravity: 1.013 (3.25° P)

IBUs: 46

SRM: 4.5

ABV: 5%

Boil Time: 60 minutes

Assumed Brewhouse Efficiency: 75%

DIRECTIONS

Mash grains at 149° F (65° C) for 90 minutes. Mash out at 168° F (76° C) for 10 minutes.

EXTRACT VERSION: Substitute 8 lb (3.63 kg) extra-pale or Pilsner malt extract syrup for the Optic pale malt. Color may be slightly darker than all-grain version (4.1 SRM).

ry. This is still shy of the lowest allowable strength for 21A American IPA, however, which starts at 1.056, so British golden is better compared to the session-strength IPA variant. It's also lighter on bitterness, for all its hop histrionics, with a 20 to 45 IBU range as opposed to American IPA's 40 to 70.

The malt bill requirements for the style are fairly open. English pale malt would be the most obvious choice, but with so much emphasis on hops, a more neutral base malt like pale two-row should work just as well and save a bit of coin over the imported stuff. Since the low end of the suggested color range is an almost-impossible-to-achieve 2 SRM, one might also consider using an ultra-light Pilsner malt—Briess, for example, has one of the lightest color ratings for its Pils, at 1 SRM. In fact, the BJCP 2015 Guidelines list “low-color pale or lager malt” as a characteristic ingredient. Since this is an ale brewed to challenge light lagers, such a pale hue would stand to reason. But for those of us wanting to emulate the classic Hop Back Summer Lightning, 100 percent Optic pale malt is the way to go.

Sugar can be used in this style, as it often is in West Coast IPA, to dry the palate and finish and boost alcohol, thus further accentuating hop bitterness. My preference is to stick with pale malt only in the grain bill, just because that's what Hop Back does—it's beer boasts a beautifully sticky white foam as a result. But if you'd prefer to maximize dryness, lower the base malt to 8 pounds (3.63 kg) and add one pound each of dextrose (corn sugar) and wheat malt. That will lower the finishing gravity a couple of points Plato, but still allow for excellent head retention.

British or English ale yeast is best for this style, but clean-fermenting varieties are preferred. Fruity aromas should come more from hops than from esters produced during fermentation, and diacetyl is out of place in a British golden ale. The challenge is that most clean British ale strains aren't attenuative enough to bring an all-malt beer of this original gravity down to the 1.006 to 1.012 finishing gravity range specified in the style guidelines. I suspect Summer Lightning finishes a bit higher than 1.012, but its finish is quite

dry, with hops lingering on the palate well into the aftertaste. Hop Back is reported to use the London III ale yeast strain, but it would take some extra work to have it attenuate down to the desired range. Perhaps it's splitting hairs from a brewing perspective, but I would rather go with something like White Labs' Dry English strain, and content myself with 1.013 to finish. Of course if you are concerned that 1.013 is still too high, the Chico/California Ale strain will be happy to chew your golden ale down to 1.011 or 1.012.

Water should be carbon filtered, preferably RO filtered, with a modest dose of calcium. Use of the sulfate form will bring out the best from the hops, so use 1 to 2 grams of gypsum per gallon in the mash.

Mash long and low to produce a highly fermentable wort, and boil the minimum 60 minutes to minimize color development in the kettle. You might also wait to fire up the kettle until the full pre-boil wort volume is run off; this will also help minimize caramelization and keep your ale as pale as possible.

Packaging is your choice: kegs are simple and elegant, but this is a beer that takes very well to bottle conditioning. Use corn sugar if you go the latter route, and target 2.5 volumes of CO₂ for this British pale rather than the normal 1.5 to 2.2 you'd expect for cask bitters. That will show off the fluffy white foam you've worked so hard to achieve, and the extra carbonation will help balance the beer more toward the dry side.

Have fun with this bracing, hop-forward Pilsner substitute, and don't be afraid to experiment with other fruity, citrus varieties of hops beyond the steadfast, classic Goldings. A British golden ale with Citra or even Lemondrop, for example, might be just the ticket.

Resource

1. Doward, Jamie and Rob Stevens. “Golden Ales Come of Age as Flavour of the British Summer.” *The Guardian*, May 30, 2015.

Amahl Turczyn is associate editor of Zymurgy.

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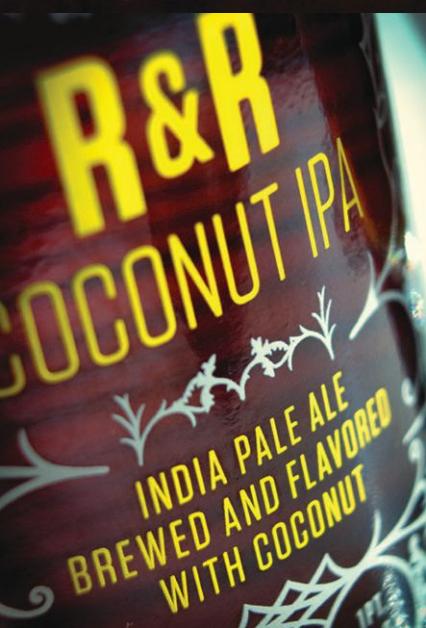


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Stone Brewing has jumped to the forefront of modern day IPA creation by using ingredients such as coconut, green tea, and coffee.

modern day

By Mitch Steele



From its craft beer origins as a very special offering in the 1980s, the popularity of the IPA style has continuously grown to the point where it is now the flagship style for many craft brewers. Some breweries even offer several different versions of IPA simultaneously in their everyday lineup. With so many great IPAs available to craft beer fans, most brewers today are finding it's not enough to simply brew a great beer.

Instead, they're continually innovating and investigating the use of new techniques or ingredients. Let's take a look at where IPA is headed.

Old School vs. New School

The American IPA style has evolved tremendously in its more than 30-year history in craft brewing. Successful hop breeding programs have led to many different flavor profiles, and over the last 15 years, IPAs have generally become drier, less malty, and more intensely hop forward.

The IPAs of the 1990s and early 2000s were typically brewed to the following parameters:

- Chinook, Cascade, Centennial, and/or Columbus hops (the 4 Cs)
- 15-16° P / 1.060-1.064 SG
- 6.5-7.5 percent ABV

- Low levels of light crystal malts and/or Munich malts
- Dry hopped at 0.5-1.0 lb/bbl (7-15 grams/gallon)

Modern IPAs by some of the best craft brewers in the world are brewed to these parameters:

- New hop variety (Amarillo, Simcoe, Nelson Sauvin, Mosaic, Equinox, Lemondrop, Vic Secret, etc.)
- Hop bursting: Getting all or most of the bitterness from late kettle and whirlpool additions, therefore retaining more hop flavor and aromatics, and achieving a mellower, smoother bitterness
- 16-18° P / 1.064-1.072 SG
- 7-8 percent ABV—pushing the ceiling with ABV, though above 8 percent is double IPA territory
- No crystal malts
- Dry hop at a rate of 1-2 lb/bbl (15-30 grams/gallon)

Some craft brewers and homebrewers in Southern California have proclaimed that they will never dry-hop with less than 2 lb/bbl (15 to 30 grams/gallon). This is a pretty major shift in hop usage, and is actually causing some concern regarding future hop supplies. When coupled with the industry's amazing growth, it's clear to see that demand for hops is outpacing supply.

Now that some brewers have designated their older IPAs as "classic IPA" or "old school IPA," it clears the slate to brew more innovative IPAs using newer hop varieties. The search for new varieties has taken on a life of its own. Private and public hop breeding programs are putting high levels of focus into developing varieties with unique flavors such as melon, strawberry, bubblegum, vanilla, oak, and lime. Hops sourced from growing regions around the world (such as Australia and New Zealand) present brewers with an incredible array of flavors from which to choose. And regional hop farming in the United States is also resulting in some new flavors from classic varieties—Cascade hops grown in the Midwest or on the East Coast can have intriguing flavor differences compared to Cascades grown in the Pacific Northwest, for example.

Another interesting development is the acceleration of scientific studies on the biochemistry of dry hopping. Much research has been done on flavor stability, biotransformation of hop oils by yeast after dry hopping, flavor extraction, and important oil compounds involved in dry hop character. Much of this work is being done at Oregon State University, as Dr. Tom Shellhammer and his students are realizing the potential impact of research on how craft brewers will approach dry hopping in the future.



East Coast vs. West Coast

As the evolution of IPA continues, the concept of East Coast vs. West Coast IPA is being reevaluated. In general, East Coast IPAs have been largely regarded as being more malt balanced and more influenced by English beers. They have higher levels of crystal malts, lower bitterness at 45 to 65 IBUs, and are not considered as aggressive as the IPAs brewed on the West Coast. Conversely, West Coast IPAs have been characterized as having very little malt balance, with bitterness at 70 IBUs or higher, and with a drier, more hop-forward taste.

This generalization has been questionable at best over the years, as there are several examples of both versions being brewed on either coast. And now, with increasing frequency, brewers on the East Coast are following the lead of beers like The Alchemist's Heady Topper—IPAs that are unfiltered; brewed with no colored malts, but often with some wheat malt; use massive late hopping and dry hopping more associated with West Coast IPAs; and use newer hop varieties. Is this the new East Coast style? Time will tell.

Different Strengths

Following the success of the double/imperial IPA style in the early 2000s, brewers have looked for opportunities to brew IPAs at different alcohol levels. It's important to note that the alcohol content of a beer has a direct influence on the intensity of flavors extracted during the dry-hopping process. With higher alcohol levels, hops tend to provide more intense fruity character, and at lower ABV levels, hops can come across as more herbal or grassy.

Triple IPA would appear to be a natural progression of more extreme IPAs, but

the style never really took off and has not been clearly defined to date. That said, most brewers feel that a triple IPA should be brewed to the following parameters:

- 10 percent ABV or higher
- 100+ IBUs
- No crystal malts
- Massive dry-hop: 2-3 lb/bbl (30-45 grams/gallon)

A triple IPA is more like a hop wine than an IPA, and brewers can struggle with making these beers taste substantially different than a hoppy barleywine. Worth noting is the impact of the high ABV on the perception of increased fullness and sweetness in a beer—that's the challenge of making a triple IPA. Brewers who excel at the style have successfully been able to brew a very dry beer at a high alcohol level. This can be accomplished by using very low conversion rest temperatures with a long (two-plus-hour) rest, and using up to 10 percent sugars to increase the original gravity and ABV without increasing the maltiness of the beer.

I'm starting to see some "quadruple" IPAs brewed to 14 to 16 percent ABV. Getting a beer to this high of an alcohol content is a challenge in itself. Brewers must use a very alcohol-tolerant yeast and a fermentation regime that involves constant feeding of nutrients and oxygen. This in turn can result in a very estery beer, with



Stone Brewing's 2013 Dayman IPA collaboration with Two Brothers and Aleman used Citra hops and roasted coffee.

the yeast esters completely overwhelming the dry-hop character. These beers are such a challenge to pull off that I don't see them becoming a big player, but they are fun to taste!

Session IPAs looked like they were going to be the rage a couple of years ago, and certainly they are favored by brewers and other brewery employees faced with tasting beer for many hours at a time as part of their jobs. Brewers who make session IPAs are faced with the challenge of thin body and increased herbaceous hop character coinciding with a low alcohol level. Hop selection is critical for this style—choose varieties that are over-the-top fruity, and

use malts that help accentuate body, such as Carapils at 5 to 10 percent. Some brewers increase the amount of crystal malt in their session IPA to provide more body.

Session IPAs have come under scrutiny by those who feel the style is simply a hoppy pale ale, but I don't agree with that assessment. Pale ales by definition have more malt balance, while session IPAs are typically hopped at a higher rate, similar to that of a double IPA. This has created a conundrum: the brewing costs (because of the hopping regime) are similar to IPA and double IPA, so session IPAs are typically priced similarly to regular strength IPA, and consumers have shown they don't want to pay a premium price for a beer less than 5 percent ABV.

Unusual Ingredients

As the IPA style has grown, so has the willingness of IPA brewers to add fruits, herbs, spices, and other ingredients that complement or contrast the flavor of the hops and add complexity. The key to making a great IPA with these ingredients is to strike a balance between the ingredient and the hops. Any IPA must, by definition, be hop forward, so the added ingredient should be perceived, but should not interfere with the hops. That is not always easy to do. Following are some examples of ingredients and suggestions on how to add them.

Peach IPA

Recipe by Mitch Steele

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

Assumes 72% efficiency

11.5 lb	(5.2 kg) pale malt
0.5 lb	(227 g) dextrin malt
0.75 lb	(0.35 kg) light Munich malt
1.5 oz	(42 g) Warrior, 15% a.a. (60 min)
0.5 oz	(14 g) Australian Galaxy (whirlpool)
2.0 oz	(57 g) peach juice concentrate, added at end of fermentation, about 1.024-1.032 SG. Note: if using puree, use twice the amount.
1.0 oz	(28 g) Australian Galaxy (dry hop)
1.0 oz	(28 g) Australian Helga (dry hop)
1.0 oz	(28 g) Mosaic (dry hop) (feel free to substitute any other peach-like hop)

White Labs WLP001, 002, or 007 ale yeast

Original Specific Gravity: 1.064

Final Specific Gravity: 1.012

IBUs: 70

SRM: 10

Boiling Time: 60 minutes

DIRECTIONS

Mash at 150° F (65° C) for 75 minutes, collect runoff, and boil for 60 minutes. Ferment at 72° F (22° C). Add peach juice concentrate when specific gravity reaches 1.032. Rack when gravity stabilizes around 1.012, then dry hop with the hop blend. Chill 36 hours later.

EXTRACT VERSION

Substitute 8 lb 6 oz (3.8 kg) extra pale malt extract syrup for pale malt and 8 oz (227 g) Munich malt extract for Munich malt. Steep milled dextrin malt in 160° F (71° C) water for 30 minutes. Drain, rinse grains, and dissolve extract completely. Use RO or distilled water to top off to desired boil volume, and proceed as above.

Imperial Coffee IPA

Recipe by Mitch Steele

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)
Assumes 72% efficiency

15.0 lb (6.8 kg) Maris Otter or Golden Promise English pale malt
1.0 oz (28 g) Cascade, 5.5% a.a. (first wort)
1.0 oz (28 g) Centennial, 10% a.a. (60 min)
1.5 oz (42 g) Citra, 12% a.a. (steep/whirlpool)
1.5 oz (42 g) coarse ground light roast coffee (hung in bag in whirlpool)
3.5 oz (98 g) Citra, 12% a.a. (dry hop)
2.5 oz (71 g) coarse ground light roast coffee (in a mesh bag added after dry hop)

White Labs WLP001, 002, or 007 ale yeast

Original Specific Gravity: 1.076

Final Specific Gravity: 1.014

IBUs: 80

SRM: 6

Boiling Time: 60 minutes

DIRECTIONS

Mash at 149° F (65° C) for 75 minutes, collect runoff, and boil for 60 minutes. Ferment at 72° F (22° C). Rack to secondary when specific gravity stabilizes near 1.014. Dry hop with the Citra hops. Chill 24 hours later. Add the coffee two days prior to bottling or kegging.

EXTRACT VERSION

Substitute 11.5 lb (5.22 kg) extra pale malt extract syrup for Maris Otter malt. Dissolve extract completely in RO or distilled water to desired boil volume, and proceed as above.

Citrus

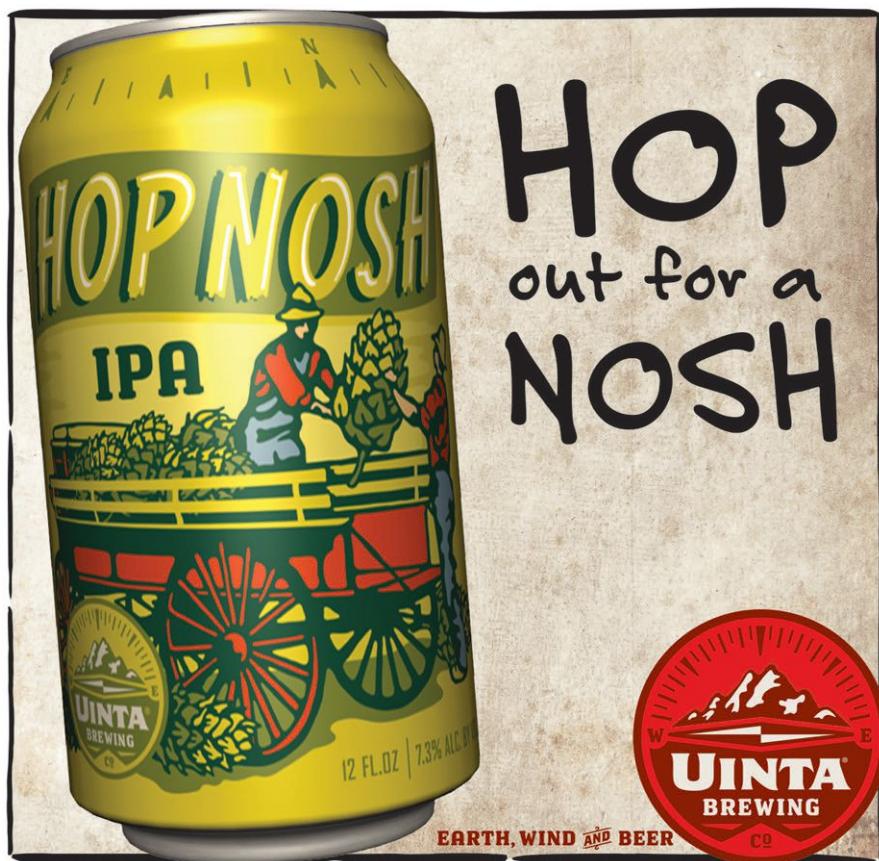
Citrus fruit is a natural flavor complement to IPAs brewed with citrusy hops such as Centennial, Cascade, and Amarillo. Grapefruit IPA has become very popular, but lemon, orange, and tangerine can also work well in IPA. Be careful with lime, as it can be too intense and may clash with the hop flavors.

The most common technique for adding citrus to IPAs is to use dried peel. This can be added to the whirlpool or secondary at 5 to 10 grams per gallon, depending on the fruit and the desired intensity. If you are using fresh peel, double the addition rate because the water content in fresh peel dilutes the flavor intensity. Some brewers use the whole

fruit, macerated or chopped, and others opt for juice or juice concentrate, which is convenient and effective. If using concentrate, use at a rate of about 0.1 to 0.2 percent of the total beer volume. You don't need much. We haven't had much success at Stone Brewing adding juice in the brewhouse—some really strange flavors have developed, so I recommend adding it to the fermenter. If you want a brewhouse addition, use peel. One other caution: adding the acidic concentrate or juice in the brewhouse or during fermentation can result in a pH drop that can impact the ability of some yeast strains to complete fermentation.

Stone Fruits, Tropical Fruits, and Berries

Peaches, berries, mangos, apricots, and other fruits can also pair nicely with hop flavors. Many of the newer hop varieties, particularly Mosaic and the hops from Australia and New Zealand, are loaded with peach and tropical fruit flavors, and there are several varieties grown all over the world that can add berry components to the beer. Hops like Bramling Cross (blueberry), Pacific Gem (blackberry), Belma (strawberry and grape), Nelson Sauvin (gooseberry), and potentially Mosaic would be wonderful in a berry IPA. The easiest and safest way to use these fruits is to add pasteurized puree, juice, or juice concentrate to the fermenter. When adding whole or unpasteurized fruit, you risk wild yeast activity in the beer, which will result in a major



flavor change. Add puree or juice at about 5 to 10 grams per gallon, depending on the fruit and the desired flavor intensity. Again, beware of the pH impact of the juice addition on the yeast.

Peppers

Jalapeño and habanero have found a home in many IPAs, but determining an addition rate can be a challenge. Peppers vary significantly in heat and fruit flavor intensity, so some trial and error is required. Start with 0.25 to 0.75 ounce per gallon and adjust as needed. Dried peppers may provide a very different character and intensity compared to fresh peppers. Tread lightly to start. It's easier to add more if needed, but impossible to take it out after it has been added.

Coffee

I admit, I was skeptical about how coffee would work in an IPA, but after I tasted the Dayman IPA collaboration we did with Two Brothers and Aleman in 2013, I was sold. The citrus character from the Citra hop paired wonderfully with the roasted coffee flavors. Coffee can be added in the brewhouse or post fermentation; often a combination of both additions is used.

When added in the brewhouse, whole coffee beans at about 30 to 40 grams per gallon can be added to the mash for a subtle flavor, or ground coffee can be hung in mesh bags during the whirlpool step at about 15 grams per gallon for a more intense flavor. Some brewers prefer adding the coffee cold after fermentation, and this can provide a smoother, mellower coffee flavor. Fifteen grams per gallon is a good place to start. My preference is to go light with the brewhouse addition, then add a little more post fermentation if needed. That helps avoid any of the acidity and harshness that can come from hot brewed coffee.

Tea

Tea also pairs well with hops. I recommend adding tea post fermentation (as for dry hopping) at about 20 to 30 grams per gallon, since hot tea additions can result in too much astringency. Teas can provide a wide range of flavors. Teas we have used successfully include Earl Grey with its Bergamot orange character, and Japanese Sencha green tea, which pairs wonderfully with herbal hop flavors.

Cacao/Cocoa

Chocolate works in a similar manner to coffee in IPAs. I find it best to add cocoa

Green Tea Double IPA

Recipe by Mitch Steele

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

Assumes 72% efficiency

16 lb, 6 oz (7.43 kg) American pale malt

8.0 oz (227 g) blonde candi sugar powder
or dextrose (added to boil)

2.0 oz (57 g) Warrior, 15% a.a. (60 min)

1.0 oz (28 g) Amarillo, 10% a.a. (10 min)

1.0 oz (28 g) Goldings, 5% a.a. (steep/
whirlpool)

2.0 oz (57 g) Crystal, 4% a.a. (steep/whirl-
pool)

1.0 oz (28 g) Aramis (dry hop)

1.5 oz (42 g) Goldings (dry hop)

1.5 oz (42 g) Crystal (dry hop)

3.0 oz (85 g) Sencha green tea (in a mesh
bag added after dry-hop)

White Labs WLP001, 002, or 007 ale yeast

Original Specific Gravity: 1.082

Final Specific Gravity: 1.012

IBUs: 90

SRM: 5

Boiling Time: 60 minutes

DIRECTIONS

Mash at 150° F (66° C) for 75 minutes, collect runoff, and boil for 60 minutes. Ferment at 72° F (22° C). Rack to secondary when specific gravity stabilizes near 1.012. Dry hop with the three hops. Chill 24 hours later. Add the dry tea two days prior to bottling or kegging.

EXTRACT VERSION

Substitute 12 lb (5.44 kg) extra pale malt extract syrup for pale malt. Dissolve extract completely in RO or distilled water to desired boil volume, and proceed as above.



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at the end of the boil so it melts and is evenly dispersed in the wort. Steeping nibs in beer post-fermentation is also effective. Anywhere from 20 to 60 grams per gallon can be used, depending on the cocoa and the desired intensity.

Coconut

Coconut requires fairly heavy addition rates, 50 to 100 grams per gallon. It's best to add it both in the whirlpool and post fermentation to get the flavor dialed in. I've found it effective to use a lightly toasted, dried coconut, as this really intensifies the flavor. If you toast the coconut yourself, be careful, as it goes from lightly toasted to completely burned in a matter of seconds! I've heard of brewers adding coconut milk to hot wort to enhance the coconut flavor, but I have no experience with that method.

Spices and Flowers

Dried jasmine flowers add a nice floral complement to the hop profile. Lemon verbena pairs nicely with citrusy hops. Anise could pair well with El Dorado, since this hop has, in addition to its intense lemon flavor, a spicy anise component. Hibiscus, ginger, sage, juniper, mint, and coriander can all blend with, and add an intriguing layer of flavor complexity to, hops in an IPA.

The concern with adding any spice to a hop-forward beer is striking the proper balance of the special ingredient with the hops. The spice should be noticeable but shouldn't overpower the hop flavor. It's easiest to add these ingredients in the whirlpool at about 5 to 10 grams per gallon to start with. Go light, because more can be added post fermentation. When adding the spices post fermentation, be mindful of contact time to avoid too much herbal character.

Emerging Trends

It will be interesting to see where IPA is headed in the next few years. Certainly new hop varieties will impact many recipes, and creative brewers will find new and interesting ingredients to complement the hop load. Some trends we can expect to see include:

- Barrel- and wood-aging IPAs. This can result in some interesting flavor combinations—vanilla and wood can be quite pleasant in combination with a citrusy hop. It is important to not overwhelm

the hops with wood character, and spirit remnants in the barrel can make this even more difficult.

It will be interesting to see where IPA is headed in the next few years. Certainly new hop varieties will impact many recipes, and creative brewers will find new and interesting ingredients to complement the hop load.

- Estate IPAs brewed with hops grown on the brewery site. An increasing number of brewers are growing hops on their property and using them in special beers, most often in the form of wet hops.

- Increased use of hop oils. Sierra Nevada's Hop Hunter IPA is an indication of how distilled hop oils can be used to make a great IPA. Craft brewers have largely avoided hop oils in the past, considering them the realm of large brewers, but now several brewers are using hop oils to either augment or even replace their dry-hop additions.

- Complementary styles such as hoppy lagers. India pale lagers, a variation on the imperial Pils style, are already becoming popular, but it will be interesting to see how hoppy lagers in general will be revived by more craft brewers.

- IPA treatment akin to other beer styles. We've seen this already with wit IPA, but how about basing an IPA off of an Oktoberfest or altbier? Or a smoked IPA?
- IPA with marijuana. The flavors are complementary (or so I've heard). The legalities of this might be a challenge, though!

Who knows? Maybe regional differences in IPA will reemerge as more craft brewers around the world formulate their own take on the style.

Mitch Steele is brewmaster at Stone Brewing Co. in Escondido, Calif.

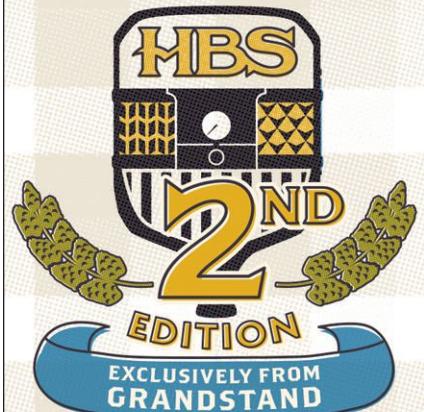


For more IPA recipes, head to HomebrewersAssociation.org/recipes.

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Todd Boera at Fonta Flora Brewing in North Carolina created a bright red Appalachian saison called Beets, Rhymes and Life, made with Bluebird Farm's bull's blood beets.





By Stan Hieronymus

Foraging For Fermentables

(Safely) Using Local Ingredients

A

lmost 300 years before American brewers learned how to use corn to further popularize their lagers, would-be colonists in Virginia made what they called *beere* with the grain. Thomas Hariot described the process in a narrative about the unsuccessful effort to establish a settlement on Roanoke Island, part of what would become North Carolina, between 1584 and 1586.

"Pagatown is a kind of graine, so called by the inhabitants; the same in the West Indies is called *mayze*. Englishmen call it Guinney wheate, or Turkie wheate, according to the names of the countreys from whence the like hath beene brought," he wrote fewer than 100 years after Columbus' men first encountered the native American grain. "The graine is about the bignesse of our ordinary English peaze and not much different in forme

and shape, but of diverse colors—some white, some red, some yellow and some blew. All of them yelde a very white and sweete flowre, being used according to his kinde it maketh a very good bread. Wee made of the same in the countrey some mault, whereof was brued a good ale as was to be desired. So, likewise, by the help of hops, thereof may bee made as good *beere*."

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Newcomers to America produced plenty of beers with native ingredients during the following centuries, but as Stanley Baron wrote in *Brewed in America* about a beer made from peaches, those "did not change the direction of brewing." The first settlers turned to alternative sources for fermentables and looked elsewhere for ones that would take the place of hops, since they were trying to brew beers that tasted like the ones they left behind.

Persimmons, for instance, were a means to an end. Now Fullsteam Brewery in North Carolina pays local foragers \$2 a pound to help collect 2,000 pounds of persimmons. The brewers freeze the fruit, thawing it in spring to brew an 11 percent ABV ale that will be released when the 2016 persimmons are ready to pick. Persimmons are part of a tradition in North Carolina, used when brewers were desperate to find anything fermentable.

But, "just because it grows around here doesn't mean you need to brew with it," says Fullsteam founder Sean Lilly Wilson. Shortly after the brewery opened, Fullsteam tried making a beer with kudzu, an invasive vine that grows locally. It had an interesting Nehi grape soda aroma, Wilson says, but "it made a lousy beer."

Brewing local has come to mean everything from using regionally grown grains and hops to adding ingredients direct from the garden, or found growing wild in a stand of trees or along a local road. But before breaking free of the Reinheitsgebot, it is worth considering why that edict that beer be brewed only with malt, hops, water, and yeast (in the revised edition) is referred to as the "beer purity law."

Just because there's a recipe out there for beer made with angelica, bitter almonds, or ginger does not mean it is safe to collect those ingredients in the wild and throw them into a batch of beer. Angelica, for instance, can be mistaken for wild hemlock, so foraging for it is unwise. Bitter almonds are a source of cyanide, although the more common domesticated trees produce nuts that are harmless. And wild ginger? It smells like, but does not look like, ginger. More importantly, it contains aristolochic acid, which can cause kidney damage.



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THERE ARE PLENTY OF OTHER FUN AND SAFE-TO-USE INGREDIENTS THAT ALSO FLUNKED REINHEITSGEBOT 101.

HERE ARE 10 EXAMPLES:



1. Corn

Agrarian Ales outside of Eugene, Ore. uses the technology for brewing adjunct beers developed in the 19th century to create one released each year for Cinco de Mayo. The history goes back even further—800 years ago, the Pueblo Indians made the first beers in the Americas using corn. Brewmaster Tobias Schock gently toasts Vermont heirloom corn, then uses it in a cereal mash, with the goal of keeping the flavor subtle. The multi-colored corn, named for the Abenaki Indian tribe, comes from the Lonesome Whistle Farm across the Willamette River from the Crossroads Farm where Agrarian is located. He adds guajillo chiles—locally grown and roasted—near the end of the boil, at flame out, and for dry hopping. This lager is called, appropriately enough, Indigenous.



2. Birch

Scratch Brewing served all “tree beers” at the 2015 Great American Beer Festival. Their investigation into using all the parts of a tree began after co-founder Ryan Tockstein read about making syrup from hickory bark. To make a birch beer they use sap from the tree in place of water when brewing, toast the bark to add flavor, and use branches and leaves for bittering. The beer is further flavored with a tea made using Chaga, a mushroom unique to birch and other hardwood trees that is valued because it is high in antioxidants.



3. Beets

One of the challenges of brewing with unique ingredients, Tockstein points out, is that drinkers expect to be able to taste them. That makes it easy to use too much. “Think about what you want to do and cut it into half or less,” Tockstein advises. With beets it might not make a difference, because they are so distinctive. “It’s a love-hate flavor,” says Todd Boera at Fonta Flora Brewing in North Carolina. His bright red Appalachian saison called Beets, Rhymes and Life, made with Bluebird Farm’s bull’s blood beets, won a gold medal in the Field Beer category at the 2015 Great American Beer Festival. He chops up whole beets, puts them in a food processor, and adds them at the end of the boil. This creates a beet-forward aroma, earthy and green.



5. Basil

Cooks, and therefore brewers, can choose from more than 160 named basil cultivars, most of them offspring of sweet basil. These varieties include some with hints of lemon to others rich in cinnamon. In years past, Firestone Walker Brewing in Paso Robles, Calif. dry hopped its DBA (a British pale ale) with a variety called African Blue. “It really worked,” said brewmaster Matt Brynildson. “Aromatically it is very similar to hops—loads of spicy yet fruity aroma.”

4. Rhubarb

Rhubarb is another plant that, like beets, colors a beer pink to red. In most of the rest of the world, it is a vegetable. In the United States it has been considered a fruit since 1947 when a New York court classified it that way for purposes of regulations and duties. Its stalks have a strong, tart flavor, and historically have been cooked along with sugar and used in pies (thus its nickname, the “pie plant”). It can add interesting complexity to a sour beer because lactic acid bacteria in a mixed culture can convert malic acid found in the stalks to more pleasant lactic acid, softening the tartness of raw rhubarb. Cantillon soaked rhubarb in both its 2008 and 2012 Zwanze beers. But rhubarb should be used cautiously—its leaves contain oxalic acid, which can be poisonous.

Before Fullsteam Brewery opened in North Carolina, Wilson and brewmaster Chris Davis attended a meeting of the Southern Foodways Alliance in Oxford, Miss., where the only beer available was Budweiser. Davis dropped a bit of basil in the can and it was a revelation. He decided to use basil in the first beer brewed at Fullsteam. “It was a big hit,” Wilson said. “What I love is being able to experiment with different basil.” In fact, basil contains many of the essential oils—including myrcene, linalool, citronellol, pinene, and caryophyllene—prominent in hops.



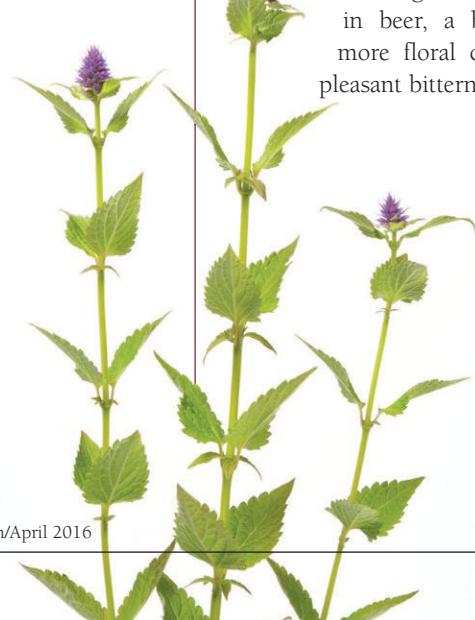
**Stay tuned for the new
Brewers Publications
book *Brewing Local* by
Stan Hieronymus in fall 2016.**



6. Eucalyptus

In 1847, British botanist John Lindley wrote that the eucalyptus tree "furnishes the inhabitants of Tasmania with a copious supply of a cool, refreshing, lightly aperient liquid, which ferments and acquires the properties of beer." A tree could produce four gallons of sap a day, which would begin fermenting as it dripped down the tree. There are more than 600 species of eucalyptus around the world, but the Tasmanian blue gum that originated in Australia also thrives in coastal California, particularly in the San Francisco Bay Area. Leaves provide the tree's distinct scent—woody, minty, hinting of menthol, but turning to medicinal when overused—and may flavor bitters, vermouth, gin, and vodka.

Bob Kunz at Highland Park Brewing in Los Angeles has used eucalyptus in his Yard Beer, each batch inspired by walking through his neighborhood, grabbing potential ingredients, and rubbing them between his palms to get to know them. "The ingredients inspire the beer," he said. "For Yard Beer it's understanding how the flavors will relate."



7. Bee Balm/ Bergamot

Bee balm and bergamot are two of several names for the same plant in the mint family. They are altogether different than the fruit of the bergamot citrus tree that grows primarily in Italy, France, and Turkey. The tree yields fruit harvested mostly for essential oils, smelling of orange and lemon, used in aroma therapy. Bee balm, or bergamot, is native to the woodlands of North America and bees find its colorful wildflowers particularly attractive. Native Americans valued it as a medicinal plant, and bee balm is a natural source of the antiseptic compound thymol, the primary active ingredient in some modern commercial mouthwash formulas. The leaves of bee balm were used to make tea during the Revolutionary War. It adds peppermint and oregano flavors, and can be a touch bitter because of the thymol.

8. Hyssop

Benedictine monks used hyssop to make liqueurs a millennium ago, and today it adds flavor to Benedictine and Chartreuse. It was used as a strewing herb of the Middle Ages, spread on the floor to ward off lice and otherwise known for its deodorant properties. Both the flowers and leaves are useful, creating a sweet impression in beer, a bit minty, with more floral character and a pleasant bitterness.



9. Coriander/ Cilantro

One of the first European spices cultivated in America, coriander seldom appeared in recipes for beer until recently. Technically, coriander refers to the whole plant, which is also called cilantro. But most often coriander is used to describe the seeds, which have been used since ancient times (the plant supposedly grew in the Hanging Gardens of Babylon) as a medicinal and culinary herb. The edible leaves are more often referred to as cilantro when used fresh, and their aroma is particularly divisive. Those who enjoy it say it has a refreshing, lemon- or lime-like flavor, while those who dislike it say it tastes like soap. Studies have shown that 80 percent of identical twins shared the same preference for the herb, but fraternal twins agreed only about half the time, strongly suggesting a genetic component to the preference.

Used in beer, the seeds may have a similar effect, as some drinkers describe citrusy (particularly orange) qualities and others complain of celery or ham-like flavors. A study conducted by Boston Beer Company also found that coriander contributes to perceived bitterness. Where the coriander is grown makes a significant difference. Large-fruited types grown mainly in tropical and subtropical countries contain low oil content (0.1 to 0.4 percent). They are used extensively for grinding and blending purposes in the spice trade. Types with smaller fruit are produced in temperate regions and usually have an oil content of around 0.4 to 1.8 percent.

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10. Pineapple weed

The pineapple weed plant is native to most of the United States except where it is particularly hot and humid. Also known as wild chamomile, when crushed the flowers smell both of sweet pineapple and chamomile. The flowers are edible, but

will become bitter when the plant blooms. In beer, or herbal tea, chamomile aroma overshadows any pineapple character.

Stan Hieronymus is a frequent contributor to Zymurgy and the author of *For the Love of Hops*. His upcoming book, *Brewing Local*, will be published this fall by Brewers Publications.

(512) Pecan Porter Clone

Recipe provided by (512) Brewing Co.

Pecan trees are native to the United States, and do not grow naturally anywhere else in the world. The U.S. produces more than 80 percent of the world's crop. Texas made the pecan its official state tree in 1919 (and later pecan pie the official state pie) and one of them grows in front of (512) in Austin.

Kevin Brand opened the brewery in 2008 and brewed Pecan Porter not long after. He roasted pecans for the first batch in an oven at home. Now the brewers roast them to the point where the nuts are most enjoyable to eat. That varies a little from batch to batch, but they will always be pretty dark. Then they coarsely grind them and add them to the mash.

The exact quantity of pecans in the addition is up to the brewer. "I'd recommend experimenting to get the best results," Brand said.

INGREDIENTS

for 5 U.S. gallons (19 L)

11 lb 6 oz	(5.16 kg) organic American pale 2-row malt (80%)
1 lb 6 oz	(626 g) dark crystal malt (10%)
11.0 oz	(312 g) English black malt (5%)
11.0 oz	(312 g) English chocolate malt (5%)
12-16 oz	(340-450 g) roasted organic Texas pecans (ground in mash)
2.0 oz	(57 g) Glacier pellets, 6% a.a. (60 min.)

Mash water treated with gypsum and calcium chloride

American ale yeast, 16M cells/ml

Original Gravity: 16.5° P

Final Gravity: 4° P

IBU: 30

ABV: 6.8%

Boil Time: 60 min

Total Efficiency: 75%

DIRECTIONS

Mash grains using a single-step infusion at 154° F (68° C). Roast pecans until aromatics are released; grind coarsely and add to mash. Ferment at 68° F (20° C). Carbonate to 2.5 vol. CO₂ and package.

EXTRACT VERSION: Substitute 8.5 lb (3.86 kg) pale malt extract syrup for pale malt. Steep crystal, black, and chocolate malts with coarsely ground, roasted pecans for 30 minutes in 160° F (71° C) water; drain, rinse grains, and dissolve extract completely. Bring to a boil, add hops, and proceed as above.

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UNCHARTED TERRITORY

Brewing with

S. EUBAYANUS

By Jared Spidel



Editor's Note:

The *S. eubayanus* yeast strain is not currently commercially available. It may be obtained with a research license through the Portuguese Yeast Culture Collection (PYCC 6148).



Early in my yeast wrangling days, I was intrigued by the idea of capturing and taming a wild strain that I could turn into a house yeast. I had grand visions of crafting a beer tailored to the yeast's unique flavors and aromas. But while some homebrewers have been successful culturing and brewing with local yeast, I only ended up with bad beer.

I bagged my efforts and went back to culturing and brewing with commercial strains; it was a safer bet that way. Yet I remained on the lookout for new strains. The discovery of the yeast species *Saccharomyces eubayanus* in 2011 (see sidebar) grabbed my attention. A member of the *Saccharomyces* genus (which includes the ale species *S. cerevisiae* and the lager species *S. pastorianus*), *S. eubayanus* had the appealing potential to make good beer.

Bret Baker's presentation at the 2014 National Homebrewers Conference further piqued my interest in utilizing *S. eubayanus* as a brewing yeast. Baker obtained a sample from the Portuguese Yeast Culture Collection (CBS 12357; PYCC 6148) and brewed a low-hopped beer. He reported that the beer was clean with notes of honey, apple, and earthiness that accentuated the malt. As the fermentation temperature increased from 50° F to 72° F (10 to 22° C), he noticed a corresponding increase in esters. As Baker noted, his brewing experience with *S. eubayanus* was limited to only this one experiment. Far more work still needed to be done to truly characterize the yeast.

An online search for further examples of beer brewed with *S. eubayanus* resulted in only one reference. Kristoffer Krogerus

co-authored two academic papers analyzing *S. eubayanus*^{1,2}, and his blog, Suregork Loves Beer, references a blonde ale³. As with Baker, he noted the beer was surprisingly clean and “not bad at all.”

Comparing *S. eubayanus* and *S. pastorianus*

I was fortunate to obtain a sample of *S. eubayanus* from Baker (thanks to fellow BUZZ club member David Houseman). While Baker and Krogerus' beers were informative of the yeast's basic profile, there was no control beer for direct comparison to *S. eubayanus*. To begin to understand the uniqueness of *S. eubayanus*, I brewed a batch of German Pilsner mashed at 148° F (64° C), with a starting gravity of 1.054. After boiling, I split the wort, pitched equal quantities of *S. eubayanus* and WLP838 Southern German Lager yeast in each half, and

fermented both at 50° F (10° C). The differences in the resulting beers were quite apparent.

The WLP838 beer fermented to 1.011, or 80 percent apparent attenuation. It had the appearance, aroma, flavor, and mouthfeel typical of a German Pilsner. The beer was brilliantly clear with a slightly malty aroma and a faint hint of hops. The flavor of the medium-bodied beer was very balanced with a malty Pilsner backbone, firm bitterness, and a note of hops that lingered.

The *S. eubayanus* beer fermented to only 1.020, or 63 percent apparent attenuation. A few weeks after bottling, the beer was a bit more translucent than its counterpart, though not comparable to the cloudiness of hefeweizen. As time went on, the yeast did flocculate well, resulting in a brilliantly clear beer. While

S. EUBAYANUS

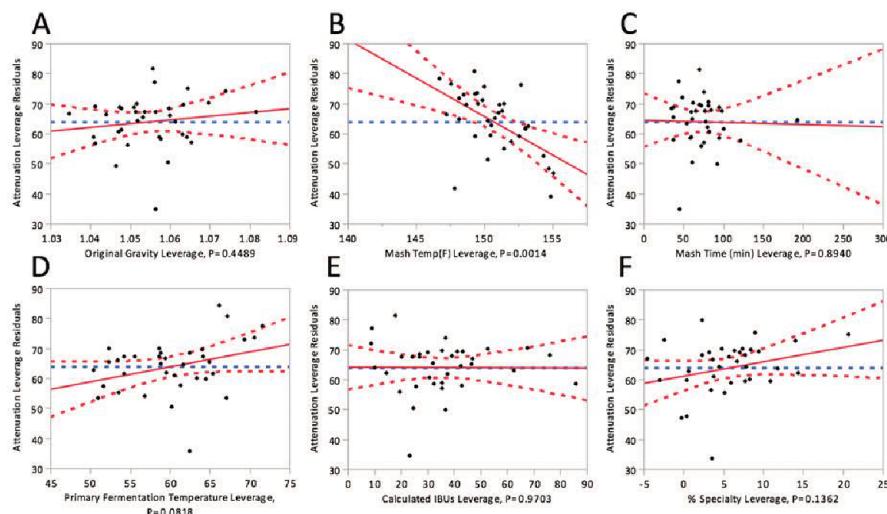
HAD THE APPEALING POTENTIAL TO MAKE GOOD BEER.

swirling the dregs in the bottle, the *S. eubayanus* yeast was less dense and looked more powdery than the thick, heavily flocculated slurry in the WLP838 bottle. The aroma itself was of malty sweetness with a touch of hops. Overall it was fairly clean, though not nearly as clean as the WLP838 beer.

The flavors of the two beers were vastly different. In broad terms, *S. eubayanus* left the beer tasting muddy and unrefined, though balanced. There were hints of dimethyl sulfide (DMS) or corn, and perhaps some phenols that lingered after swallowing. The most apparent was an apple-like flavor similar to what Baker had described. It wasn't the green apple or cidery flavor of acetaldehyde; rather it was of fresh red apple. Surprisingly, despite having almost twice the amount of residual sugar, the *S. eubayanus* beer tasted just as dry, if not more so, than the WLP838 beer.

Overall, *S. eubayanus* produced a beer that was drinkable, yet not spectacular. But this isn't a yeast you can just substitute into your favorite recipe. Imagine substituting an American ale yeast with a hefeweizen strain in an IPA. Sure, you may get lucky and have a drinkable beer, but unless the hop flavors are built around the

Figure 1: Impact of Various Brewing Parameters on Attenuation

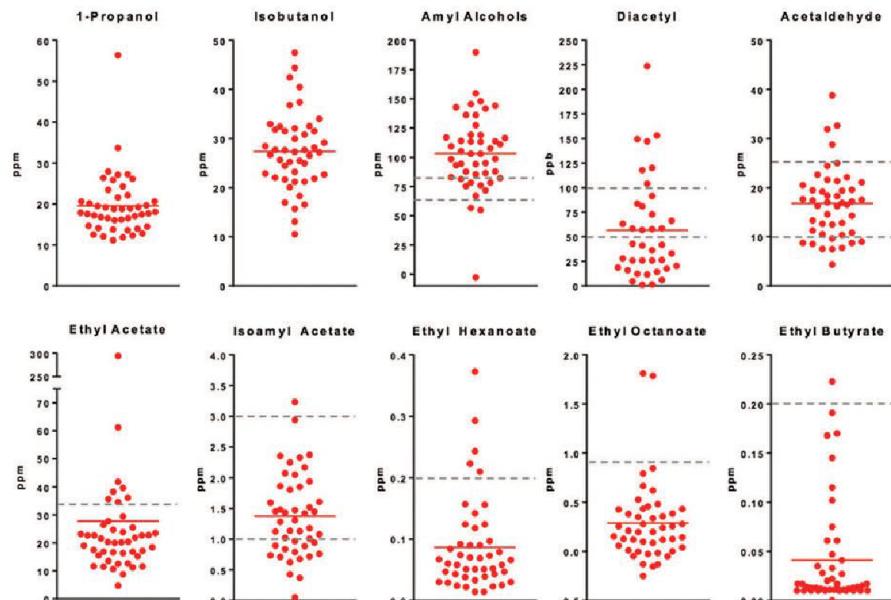


Leveraging plots were generated using JMP 11.0 software analyzing the effect of (A) Original Gravity, (B) Mash Temperature, (C) Mash Time, (D) Fermentation Temperature, (E) IBUs, or (F) the percentage of specialty malts in the recipe on the percent attenuation of *S. eubayanus*.



A BJCP-sanctioned competition using *S. eubayanus* provided by White Labs supplied valuable insight.

Figure 2: Distribution of Flavor/Aroma Compounds



The values of each beer were plotted and the mean is indicated by a red line. The detection threshold for each compound is indicated by a grey dashed line. In some cases, the detection threshold can vary, and the range is indicated by two grey dashed lines. The detection thresholds for 1-propanol and isobutanol are greater than the values on the Y-axis.

banana and clove from the yeast, you're likely to end up with a muddled mess.

With only three documented beers brewed with the yeast, there were still many unanswered questions: What are the optimal brewing parameters for this yeast? What are the best mash times and temperatures? What is the optimal pitching rate? Which hops and malt work best with the yeast? What beer styles are best suited for this species?

Designing the Experiment

To fully characterize the fermentation profile of *S. eubayanus*, multiple factors in the brewing process required exploration. Rather than brewing thousands of batches of beer

to systematically analyze all brewing parameters and combinations thereof, I turned to a statistical concept known as design of experiments (DOE)⁴. Without delving into theory, the effects of multiple input factors (e.g., starting gravity, mash temperature, mash time) on an output (e.g., attenuation) can be analyzed simultaneously by randomizing the input values across multiple samples. A statistical response model can be created from data gathered to predict how these variables interact.

Since using a DOE to analyze a sufficiently large set of variables was a huge undertaking, I enlisted the help of local homebrew clubs in a Beer Judge Certification Program (BJCP)-sanctioned competition. The pur-



pose of the competition was threefold. First, I would be able to gather data from a large set of randomized parameters for every factor of the brewing process that could be plugged into DOE response models. Second, I could gather sensory data for each of the beers from qualified BJCP judges. Third, practical brewing information on what beers are best brewed with *S. eubayanus* could be obtained using a set standard (i.e., the 2008 BJCP Style Guidelines).

In my opinion, having the uncontrollability of multiple brewers actually helped control the entire experiment. If a trend emerged for a particular output, perhaps a phenolic flavor for example, characteristics of the yeast could then be defined. Further, the performance of the yeast would be evaluated in real world brewing scenarios, thereby demonstrating the degree of its practicality as a brewing yeast.

The rules for the competition were simple. To encourage a diversity of beer styles and brewing variables, brewers were allowed to use any ingredient and brewing method—with two exceptions. The first restriction was that, in order to ascertain the best



The Best of Show beer was a brown porter brewed by Chris Clair (BUZZ, West Chester, Pa.) (left) that received a score of 37.5. The runner-up and second runner-up beers were an India pale lager and American pale ale, both brewed by Steve Groff (Main Line Brewers Association, Ardmore, Pa.) (right).

mash conditions for achieving the highest attenuation, the only allowable fermentable was maltose—other sugars could skew the results. Crystal and roasted malts with little to no fermentable maltose were acceptable (recipe data was collected to analyze trends in using specialty malts). The second was that *S. eubayanus* was the only allowable yeast.

The biggest challenge in the competition was figuring out how to provide enough quality yeast for every entrant. Chris White

and the experts at White Labs solved this by growing up a large batch of yeast and providing us with pitchable vials.

Optimizing Attenuation

In total, 49 entries from 43 brewers representing seven clubs covered 25 beer styles. Brewers recorded and submitted data for every aspect of their brewing process, including factors affecting degree of attenuation. These were analyzed by separating entries into malt extract and all-grain recipes. The mean attenuation

of the all-grain beers was 64.7 percent +/- 11.1 percent. Of these, six attenuated 40 to 50 percent, four attenuated 51 to 60 percent, 21 attenuated 61 to 70 percent, seven attenuated 71 to 80 percent, one attenuated 82 percent, and one attenuated 89 percent. The highest attenuation was most likely due to a five-hour mash that started at 142° F (61° C) and ended at an unknown but much cooler temperature.

The impact of an individual effect in the context of the other effects on attenuation was analyzed using leveraging plots⁶ (Figure 1). The confidence curves (red dashed lines) indicate the significance of the effect on attenuation; curves that cross the blue line are considered significant. These data show that only the mash temperature has a significant impact on attenuation where a low mash temperature yields a more fermentable wort. This impact is not entirely surprising. Several groups have reported that, unlike *S. cerevisiae*, *S. eubayanus* lacks a maltotriose transporter^{2,7}. Since lower mash temperatures generate fewer maltotriose molecules than higher mash temperatures, a more fermentable wort is achieved.

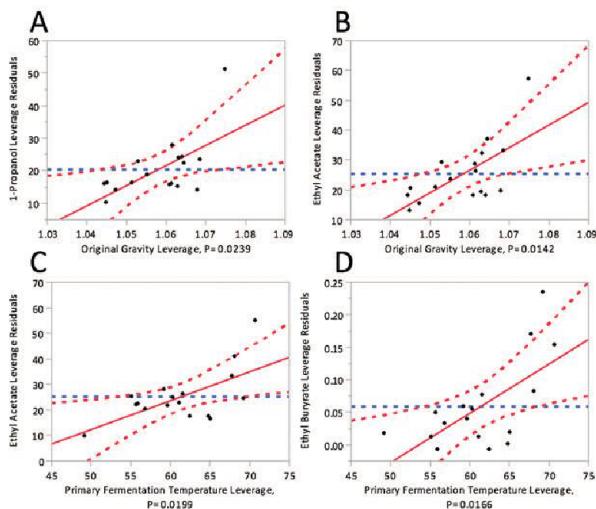
In the model, fermentation temperature had a borderline impact on attenuation. While an early report showed *S. eubayanus* does not ferment or grow very well at 72° F (22° C)², a recent paper demonstrated that not only does *S. eubayanus* grow and ferment up to at least 86° F (30° C), but that at 68° F (20° C) it grows and consumes sugars faster than *S. cerevisiae*⁷. Both reports were in agreement that *S. eubayanus* grows well at low temperatures, and consistent with these reports, attenuation as high as 70 percent was seen by multiple brewers at 50 to 54° F (10 to 12° C).

In summary, *S. eubayanus* requires a wort produced from a low temperature mash containing few specialty malts to achieve high attenuation. The fermentation temperature had little impact on attenuation, allowing brewers to ferment over a wide range of temperatures.

Sensory Analysis

Sensory information was gathered through the competition judged by Certified,

Figure 3: Effect of Original Gravity and Fermentation Temperature on Flavor/Aroma Compounds



Leveraging plots were generated using JMP 11.0 software analyzing the effect of (A, B) Original Gravity and (C, D) Primary Fermentation Temperature on the levels of (A) 1-propanol, (B, C) ethyl acetate, and (D) ethyl butyrate.

National, and Grand Master judges. The beers did not conform to BJCP styles: point scores ranged from 13.5 to 39, with a mean of 27 ± 6 . This isn't altogether surprising. *S. eubayanus* is a unique yeast that produces flavors and aromas distinct from *S. cerevisiae* and *S. pastorianus*. Nevertheless, brewing 25 styles of beer yielded a plethora of information that can be used to build a beer around the strengths of *S. eubayanus*.

As diverse as all the beers were, there were amazing similarities. Most beers displayed a pleasant grape or white wine aroma and flavor. One judge noted it worked quite well in a schwarzbiere. Another distinct flavor and aroma was the apple and pear ester mentioned earlier. Phenols were also present in many of the beers to varying degrees. They worked well in the Belgian styles and even in the hefeweizens, but clashed with some of the beers containing excessive roasted malts.

One of the biggest criticisms was under-attenuation, resulting in the beers being out of style. However, that did not mean they were unbalanced. The yeast, despite under-attenuating, can somehow produce a balanced beer. The perceived bitterness tends to be a little higher in the beers than expected from the calculated IBUs.

S. EUBAYANUS REQUIRES A WORT PRODUCED FROM A LOW TEMPERATURE MASH CONTAINING FEW SPECIALTY MALTS TO ACHIEVE HIGH ATTENUATION.

Chemical Analysis

White Labs also performed chemical analyses of the beers to determine the levels of various flavor and aroma compounds (Table 1). The data for all beers were plotted and the mean value for each compound was determined (Figure 2). Fusel alcohols (1-propanol and isobutanol) were very low. All but three beers had levels of amyl alcohols well above the flavor detection threshold, which may account for the white-wine-like flavors and aromas prevalent in many of the beers. A majority of the beers also had detectable levels of diacetyl. It is interest-



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Eubayanus Brown Porter

Recipe by Chris Clair, Best of Show

INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

8.0 lb	(3.63 kg) Maris Otter pale malt
1.0 lb	(0.45 kg) brown malt
0.38 lb	(172 g) chocolate malt
0.38 lb	(172 g) pale chocolate malt
0.25 lb	(113 g) 120° L crystal malt
0.25 lb	(113 g) 60° L crystal malt
1.0 oz	(28 g) Glacier, 5.7% a.a. (60 min)
1.0 oz	(28 g) Glacier, 5.7% a.a. (10 min)

S. eubayanus yeast

Original Gravity: 1.048

Final Gravity: 1.020

Anticipated SRM: 28

Anticipated IBU: 29

Brewhouse Efficiency: 70%

Wort Boil Time: 90 min

DIRECTIONS

Mash grains at 152° F (67° C) for 60 minutes. Sparge at 170° F (77° C).

EXTRACT VERSION

Substitute 6 lb (2.72 kg) Maris Otter malt extract syrup for Maris Otter pale malt. Steep crystal, chocolate, and brown malts in 160° F (71° C) water for 30 minutes. Drain, rinse grains, and dissolve extract completely. Top off with RO or distilled water to desired boil volume and proceed with recipe as above.

ing to note that no diacetyl was detected by any of the judges, despite at least one judge being very sensitive. It is possible that the diacetyl was masked by other compounds in the beer. Alternatively, high levels of precursor compounds (e.g., α-acetolactate) may have been present in the beers at the time of judging and, as a natural process of aging/oxidation, could have converted to diacetyl.

Acetaldehyde hovered around the range of flavor detection thresholds, and may

have contributed to the apple flavors in the beers. Surprisingly, the levels of ethyl hexanoate and ethyl octanoate were below the thresholds of detection in most samples, as these typically contribute to fresh apple flavors. Ethyl acetate was detectable in almost all beers. One beer in particular had an extreme level at 294 ppm. This beer was also the lowest-scoring beer, and was described as cidery and astringent. The levels of isoamyl acetate were on the low end of detection, and likely contributed to some of the fruitiness, though no beer had an overt

banana character (a large criticism in the Hefeweizen category). Ethyl butyrate was for the most part well below the threshold of detection.

The influence of the original gravity, fermentation temperature, and fermentation time on the levels of all the compounds was analyzed by leveraging plots. Only ethyl acetate and 1-propanol were influenced by the original gravity. As the original gravity was increased, the levels of both tended to increase (Figure 3). The

Table I: Flavor/Aroma Profile of Various Chemicals in Beer

Compound	Detection Threshold	Flavor/Aroma
Diacetyl	50-100 ppb	butter or butterscotch
Acetaldehyde	10-25 ppm	green apples, raw apple skin, bruised apples
1-Propanol	700 ppm	fusel alcohol, solvent-like
Isobutanol	200 ppm	fusel alcohol, alcoholic, solvent-like
Amyl Alcohols	60-80 ppm	vinous, solvent-like
Ethyl Acetate	33 ppm	fruity with solvent undertones
Isoamyl Acetate	1-3 ppm	banana
Ethyl Hexanoate	0.2 ppm	apple-like (ripe fresh), aniseed, pineapple, green banana
Ethyl Octanoate	0.9 ppm	apple, sweet, fruity, waxy, wine, floral, fruity, pineapple, apricot, banana, pear
Ethyl Butyrate	0.2-0.4 ppm	fruity, Juicy Fruit, pineapple, cognac, papaya

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Citra India Pale Lager/American Pale Ale

Recipe by Steve Groff, Runner-Up and Second Runner-Up

INGREDIENTS

for 7.5 U.S. gallons (28.4 L)

6.0 lb	(2.72 kg) Pilsner malt
10.0 lb	(4.54 kg) Vienna malt
3.75 oz	(106 g) acidulated malt
1.75 oz	(49 g) Citra, 11% a.a. (30 min)
1.25 oz	(35 g) Citra, 11% a.a. (10 min)
1.25 oz	(35 g) Citra, 11% a.a. (flame out)
<i>S. eubayanus</i> yeast	

Original Gravity: 1.055

Final Gravity: 1.018

Anticipated SRM: 5

Anticipated IBU: 52

Brewhouse Efficiency: 70%

Wort Boil Time: 90 min

DIRECTIONS

Mash in with a protein rest at 135° F (57° C) and hold 20 minutes. Raise temperature to 148° F (64° C) and hold 40 minutes. Sparge at 170° F (77° C). Ferment as a lager at 50° F (10° C) with a two-day diacetyl rest at 62 to 64° F (17 to 18° C). Ferment as a pale ale at 60° F (16° C).

EXTRACT VERSION

Substitute 11.5 lb (5.22 kg) pale malt extract syrup for Pilsner and Vienna malts. Omit acid malt. Dissolve extract completely with RO or distilled water to desired boil volume and proceed with recipe as above.

levels of ethyl acetate and ethyl butyrate also tended to increase as the primary fermentation temperature increased. No other compound appeared to be influenced by any other factor.

The mean values for each compound were compared to those published by Gibson et al.² and Mertens et al.⁸ (Table 2). Overall, the data were consistent. These groups demonstrated that compared to *S. cerevisiae* and *S. pastorianus*, *S. eubayanus* produced similar or lesser amounts of acetaldehyde, and these levels were similar to the beers in this study. They also found similar amounts of higher alcohols (1-propanol, isobutanol, isoamyl alcohol) between the three species of yeast. The beers in this study, however, had much greater levels of amyl alcohols than what these groups

our beers were similar to those seen in *S. cerevisiae* and *S. pastorianus*.

S. EUBAYANUS TENDED TO WORK WELL FOR BEERS CONTAINING CRYSTAL AND LIGHTLY ROASTED MALTS.

reported. The levels of ethyl acetate, isoamyl acetate, and ethyl butyrate were similar between the yeast in all of the studies. Gibson et al. reported the esters ethyl hexanoate and ethyl octanoate were 0.2 to 0.3 ppm higher than is typical with *S. cerevisiae* and *S. pastorianus*. However, the levels in

Best Beer Styles for *S. eubayanus*

The Best of Show beer was a brown porter brewed by Chris Clair (BUZZ, West Chester, Pa.) that received a score of 37.5. The runner-up and second runner-up beers were an India pale lager and American pale ale, both brewed by Steve Groff (Main Line Brewers Association, Ardmore, Pa.). It is interesting to note that Groff's beers were actually a split batch: the runner-up was fermented at 50° F (10° C) and scored a 39, and the second runner-up was fermented at 60° F (16° C) and scored a 33.

S. eubayanus tended to work well for beers containing crystal and lightly roasted

Table 2: Chemical Analysis of *S. eubayanus* Beers

Detection Threshold	Diacetyl 50-100 ppb	Acetaldehyde 10-25 ppm	1-Propanol 700 ppm	Isobutanol 200 ppm	Amyl Alcohols 60-80 ppm	Ethyl Acetate 33 ppm	Isoamyl Acetate 1-3 ppm	Ethyl Hexanoate 0.2 ppm	Ethyl Octanoate 0.9 ppm	Ethyl Butyrate 0.2-0.4 ppm
<i>S. eubayanus</i>										
% samples > threshold	73.9%	80.4%	0.0%	0.0%	93.5%	17.4%	67.4%	10.9%	4.3%	2.2%
Ave +/- Std Dev	56.76 51.04	16.81 7.22	19.58 7.48	27.37 7.81	105.95 27.75	27.81 41.48	1.38 0.68	0.087 0.076	0.289 0.407	0.041 0.055
Gibson et al. Ave +/- Std Dev	nd	52.00	7.40	13.90	18.70	23.40	1.70	0.500	0.700	nd
Mertens et al. Ave +/- Std Dev	nd	12.18 6.23	5.25 0.62	13.67 1.83	52.09 5.59	6.51 1.20	0.67 0.04	nd	nd	0.045 0.007
<i>S. cerevisiae</i>										
Gibson et al. Ave +/- Std Dev	nd	56.95 60.74	15.45 2.76	15.55 1.63	18.80 7.35	23.00 3.11	1.25 0.78	0.250 0.212	0.300 0.141	nd
Mertens et al. Ave +/- Std Dev	nd	9.40 6.66	7.77 1.35	9.39 2.13	44.18 15.15	13.40 5.06	1.06 0.37	nd	nd	0.115 0.070
<i>S. pastorianus</i>										
Gibson et al. Ave +/- Std Dev	nd	28.86 17.75	10.15 4.33	16.19 12.51	19.63 7.49	16.78 7.63	1.10 0.91	0.275 0.128	0.288 0.189	nd
Mertens et al. Ave +/- Std Dev	nd	12.08 6.24	6.08 1.45	8.38 2.28	36.26 4.74	12.14 7.35	0.76 0.40	nd	nd	0.111 0.038

The Discovery of *S. eubayanus*

For millennia, humans have cultivated the yeast *S. cerevisiae* for making bread, beer, wine, cider, and mead. In contrast to today's pitchable packages of pure, clonal, quality-controlled strains, the yeast cultivated by brewers prior to the late 19th century also contained other microorganisms. As the nutrients in wort are quickly consumed by *S. cerevisiae* to produce ethanol and lower the pH, an environment that favors *S. cerevisiae* growth over its rival species, it remains the dominant species in the yeast culture. Yet things began to change in the Middle Ages when brewing during the summer months in Bavaria was prohibited, forcing brewers to ferment and store beer at colder temperatures⁹. *S. cerevisiae* growth is slow at colder temperatures, thereby presenting an opportunity for other microorganisms to dominate the culture. This opportunity was seized by the arrival of the mysterious yeast *S. eubayanus*, sparking a brewing revolution.

S. eubayanus is a cold-tolerant yeast discovered in 2011 on trees in Patagonia¹⁰ and was subsequently found in China and Wisconsin^{11,12}. It's uncertain how it got into Bavarian beer, but through the process of selecting cold-tolerant yeast, brewers inadvertently created lager yeast *S. pastorianus* resulting from the hybridization of *S. cerevisiae* and *S. eubayanus*. The daughter yeast had two genomes, allowing it to compete with both *S. cerevisiae* and *S. eubayanus*. As the yeast began dividing and adapting to its environment, unnecessary or redundant genes were removed by chromosomal deletion and/or rearrangement. *S. pastorianus* refined its genome to become the superior yeast and eventually out-competed both *S. cerevisiae* and *S. eubayanus* to become the dominant yeast in lager cultures.

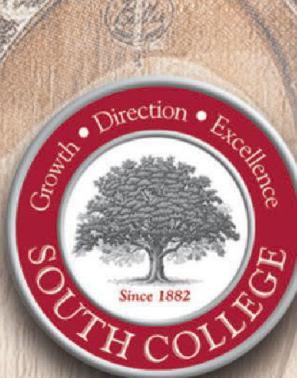
malts. Porters, English brown ales, Scottish and Irish ales, and dark lagers scored well. Pilsners, amber lagers, and light and amber hybrid beers scored in the low to mid 20s due to the amount of esters and phenols from the yeast. They did not necessarily taste bad; they were just off-style. The yeast did well in hefeweizens and Belgian-style beers, both averaging in the upper 20s. The yeast worked particularly well in saisons and Belgian pale ales where the biggest flaw was the lack of attenuation. Had the beers contained simple sugars such as sucrose, they may have scored much higher. The choice of hops seems critical for crafting a hop-forward *S. eubayanus* beer, as these beers tended to score in the low 20s. As one judge commented on an American pale ale, "this beer/yeast combo was not a pleasant experience." In contrast, both of Groff's beers were heavily hopped

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exclusively with Citra, which seemed to complement the yeast quite well.

Brewing Recommendations

Though *S. eubayanus* is a tricky yeast to work with, here are some recommendations gleaned from our experiments.

- Keep it simple at first. Start with a pale beer with no hop character so you know what flavors the yeast produces, then create recipes around those flavors.
- Mash low, but not too long. While very high attenuation was seen after a five-hour mash, the beer was unpleasant. Mash between 145 and 150° F (63 and 66° C) for 60 to 90 minutes.
- Keep the roasted malts restrained. *S. eubayanus* phenols clash with high amounts of roasted barley. Pale chocolate and Carafla seem to work well.
- Test different fermentation temperatures for nuances in ester and phenol production. While the yeast performed well from 45 to 72° F (7 to 22° C), and while beers scored well fermented at all temperatures tested, the differences between the runner-up and second

runner-up beers fermented at 50 and 60° F (10 and 16° C), respectively, were significant enough to result in a six-point difference in their score.

- Add some sugar. This should help dry the beer out by increasing attenuation.
- Choose hops wisely. Be mindful of the low attenuation and compensate by increasing the IBUs. For flavor and aroma hops, be cautious. Not all hops paired well with the yeast.
- Add another yeast. Use a clean ale or lager yeast to help dry out the beer without affecting the characteristics of *S. eubayanus*. Alternately, I suspect that adding a little Brettanomyces will create a fantastic beer. The Brett will consume the unused maltotriose, and the esters some strains produce may nicely complement the apple, pear, and grape flavors *S. eubayanus* produces.

References

1. Krogerus, K., et al. "New lager yeast strains generated by interspecific hybridization." *J. Ind. Microbiol. Biotechnol.* 42(5), 769-778. 2015.
2. Gibson, B. R., et al. "Comparative physiology and fermentation performance of Saaz and Frohberg lager yeast strains and the parental species *Saccharomyces eubayanus*." *Yeast* 30(7), 255-266. 2013.
3. beer.suregork.com/?p=2827
4. en.wikipedia.org/wiki/Design_of_experiments
5. jmp.com/en_us/software/jmp.html
6. jmp.com/support/help/Row_Diagnostics.shtml#184200
7. Hebly, M., et al. "*S. cerevisiae* x *S. eubayanus* interspecific hybrid, the best of both worlds and beyond." *FEMS Yeast Res.* 15(3). 2015.
8. Mertens, S., et al. "A Large Set of Newly Created Interspecific *Saccharomyces* Hybrids Increases Aromatic Diversity in Lager Beers." *Appl. Environ. Microbiol.* 81(23), 8202-8214. 12-1-2015.
9. Corran, H. S. *A History of Brewing*. 1975. London, UK, David and Charles.
10. Libkind, D., et al. "Microbe domestication and the identification of the wild genetic stock of lager-brewing yeast." *Proc. Natl. Acad. Sci. USA* 108(35), 14539-14544. 8-30-2011.
11. Bing, J., et al. "Evidence for a Far East Asian origin of lager beer yeast." *Curr. Biol.* 24(10), R380-R381. 5-19-2014.
12. Peris, D., et al. "Population structure and reticulate evolution of *Saccharomyces eubayanus* and its lager-brewing hybrids." *Mol. Ecol.* 23(8), 2031-2045. 2014.

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A single red apple with some natural blemishes sits atop a large mound of light-colored malted barley grains. The apple is oriented vertically, with its stem pointing upwards. The barley grains are scattered around the base of the apple and form a small hill behind it.

Quick & Easy
Malted
Cider

By Amahl Turczyn

Ideally, homebrewed cider starts with fresh must from a blend of cider apples. Skilled cider makers with apple orchards nearby can select for a balanced blend of sweet, tart, and tannic varieties, as well as those that add aromatics and flavor. It's not by accident that the Cidermaker of the Year award at the National Homebrew Competition often goes to someone from Washington State, Michigan, or New England. Many apple-growing locations even have local cider mills to do the pressing.

But although that's the ideal scenario, it doesn't mean one can't make decent cider in the rest of the country. Sure, apple juice intended for the table provides nowhere near the same complexity that a carefully selected blend of cider apples will, but, as with extract brewing, the convenience factor of making cider with store-bought apple juice often counts for a lot.

Why Malted Cider?

Cider must generally doesn't contain much in the way of yeast nutrients, so most hard cider recipes therefore call for an addition. However, malted barley wort does contain yeast nutrients, and low-gravity wort "tailings" collected after you've finished sparging a high-gravity all-grain beer are easy to come by—just sparge a bit longer once your beer boil volume has been reached. The extra low-gravity wort provides excellent yeast nutrient for cider fermentation, and lends a pleasing body, flavor, and complexity.

Companion-brewing a batch of malted cider really doesn't add much time at all to your brew day. It's also economical—rather than throwing out all those precious sugars after you've finished sparging your mash for a barleywine or double IPA, you can simply divert the low-gravity wort tailings into another vessel, boil them separately from the main brew, and blend with apple juice to your desired fermentation volume.

Flavor-wise, cider seems to work best with light-flavored, light-colored wort, but blending imperial stout wort tailings with apple juice might produce something very interesting. The most important thing might be to keep hops out of the equation if hopped cider is not to your liking.

Obviously the higher gravity the wort, the more malt flavor (and nutrients) you'll be adding to your cider, but this sort of add-

on technique really works best with higher-gravity wort tailings. Anything above 1.008 specific gravity (about 2° P) can be used without worrying about grain-based tannic and polyphenol extraction. (Fruit tannins are good in cider, as long as they are in balance; grain tannins, not so much.) Too weak a wort, however, and you'll only be diluting your apple juice, which is often already diluted from concentrate to a gravity of 1.048 to 1.053 (12 to 13° P). So if after collecting five quarts or so of wort tailings you find the average specific gravity to be less than 1.040, you may want to consider augmenting the wort to bring it up to the must's original gravity. Depending upon your chosen yeast, a 1.051 SG must (after blending with wort) will get down to 1.004 to 1.006 (1 to 1.5° P) with an English ale yeast, yielding a cider of about 6 percent alcohol by volume. This is a nice, full-flavored cider; dry, especially served sparkling, but not harsh. A 1.040 SG must after blending is a little on the light side and will not have much residual sweetness, even with the malt addition. So if you need to augment, or want your cider a little stronger than what store-bought apple juice can give you, you have a few options.



Malt Extract

Light or extra-light malt extract added to your wort tailings (or used on its own if you aren't an all-grain brewer, or want to do a super-easy batch) is a great booster for cider. Just remember, too much and you'll end up with more of an apple ale than a malted cider. Like the idea of a cider that pours from the keg with a frothy head of foam? Extract is the way to go.

Honey

Honey blends harmoniously with a malted cider and can make up a sugar deficit in a hurry. It can add floral notes if the apple juice you have available is a bit short on aromatics. Just remember that unless you go for a ludicrously big honey addition (say 10 pounds per 5.25-gallon batch, or 4.54 kg per 20 L), in which case you are now in apple mead (cyser) territory, it's best to keep the honey addition under 1.5 pounds (0.68 kg) or so. Any more, and almost all those sugars will ferment out, leaving you with very strong, dry, harsh, and probably fumy cider. Sure, you can back-sweeten such a beast in an attempt to make it more drinkable

(more on that later), but that brings with it further complications. In the interests of Quick and Easy, I'd recommend keeping your OG under 1.060 (14.75° P).

Brown Sugar

This highly fermentable booster adds a nice complexity to cider and is popular with a great number of dedicated cider makers. Brown sugar is basically just white table sugar with a bit of molasses, but be advised that too much molasses can be overpowering. Feel free to experiment with other sugars like invert, raw, or turbinado. Under 2 pounds (0.9 kg) for this batch size is recommended.

Specialty Grain Steep

Mashing a separate batch of grain just to make up for a strength deficit in your wort tailings doesn't make a whole lot of sense, but a quick steep of crushed specialty grains might. Remember that most average-strength ciders usually ferment very dry with ale yeasts, so why not steep a pound of dextrin or crystal malt in your wort tailings for that extra boost? A little extra malt dextrin will bring your finishing gravity up enough to balance the cider's natural dryness, add a pleasing body, and give you a little creative control over the finished product. Why not experiment with some darker crystal malts, or even a touch of Special B to underscore the malt component? Another key advantage is that you are adding mostly unfermentable dextrins. While my preference is to serve sparkling, malted cider on draft, thus eliminating any concerns of over-carbonation in the bottle after back-sweetening, with unfermentable sweeteners like dextrin malt, a balanced cider stable enough to bottle is entirely possible. (See section on Preservatives for more on bottling.)

**CIDER MUST GENERALLY
DOESN'T CONTAIN
MUCH IN THE WAY
OF YEAST NUTRIENTS,
SO MOST HARD CIDER
RECIPES THEREFORE CALL
FOR AN ADDITION.**

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Other Sweeteners

Along those same lines, lactose is definitely worthy of consideration for a stable malted cider. Sure, a “milk cider” doesn’t sound all that appealing, but the natural acidity of the apples should blend quite well with an unfermentable sugar like lactose.

Still, this is cider, and personally I like to maximize the apple component. Apple juice concentrate is my favorite way to back-sweeten. Yes, it is highly fermentable, so the fermented, blended cider must be refrigerated, preferably after kegging and force carbonation, but the extra apple flavor and aroma is very appealing if you get the balance right. For a 5 gallon (19 L) volume at a finishing gravity of 1.004 to 1.006 (1.5° P), I blend in just enough frozen apple juice concentrate to bring the gravity up about one point Plato to 1.012 (2.5° P) and then taste. This ends up being about two 12-ounce cans of concentrate, but I always have extra on hand. Remember that if you choose to carbonate your cider, that will affect the perception of dryness, too.

For those experimental types, you can also mix up your cider by adding flavored concentrate. Raspberry-apple can overpower the apple in a cider, but a little can be great. Pear or white grape provides subtle fruit flavor without taking too much away from the apple component. Tart cherry concentrate is also a good choice, and can make for a very attractive red cider, but it can also throw your acid levels out of balance, so taste as you go; you can always add more apple concentrate to compensate.

Acids

For added balance, a modest addition of acidity really brings a nice zip to cider made from table apples rather than true cider apples. Most table varieties have high sugar content and only a bit of acidity, with almost no astringency. Fortunately, adding acidity is as easy as blending in one to two teaspoons of cream of tartar, a common baking ingredient. It’s tartaric acid, made from purified grape skin residues, and thus has an astringent character as well. I usually go with two teaspoons boiled in about 30 ml of water in the microwave to sanitize, then dissolved into the cider before back-sweetening.

Preservatives

Even though it's advisable to start with apple juice that is preservative-free, as preservatives can negatively affect primary fermentation, back-sweetening with a concentrate with added potassium sorbate is fine—just don't assume those preservatives are enough to prevent the yeast in your 5-gallon batch of cider from re-fermenting. They aren't. If you want to be sure that your apple concentrate-sweetened cider won't re-ferment, add your own potassium sorbate.

Potassium sorbate produces sorbic acid, which renders yeast incapable of multiplying. It does not stop active fermentation—for that duty you'd need potassium metabisulfite (also called Campden tablets, or K-meta). Some people are sensitive to metabisulfite, however, and with store-bought apple juice, good sanitation, and a little patience, it isn't really necessary. If you are pressing your own apples, and there are brown spots or the occasional critter present, then yes. But sorbate is all you need with aseptically packaged apple juice and concentrate, provided fermentation is completely

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finished and the yeast is no longer active. Manufacturers recommend a half-teaspoon per gallon. Rack, blend, sweeten to taste, and package.

Again, the use of a keg is highly recommended here. You could bottle this back-sweetened “sorbated” cider—if you do, please go with PET bottles rather than glass—but you’ll have to be satisfied with still cider rather than sparkling. And even with the sorbate, there’s a chance you may still get re-fermentation. With the PET bottles, this will be obvious when you squeeze them after a week or two. If they are rock hard, you’d better get them chilled down quick.

Draft makes everything easier—no sorbate necessary, just rack your finished malted cider along with your apple concentrate, blend, force carbonate, chill to and maintain at least 40° F (4° C), and it’s ready to serve.

Apple Varieties

Store-bought apple juice is blended from a variety of table apples—not cider apples. Typical varieties in blends like Tree Top, Mott’s, and the like include Ambrosia, Braeburn, Cameo, Fuji, Gala, Golden Delicious, Granny Smith, Honeycrisp,

Idared, York Imperial, McIntosh, Rhode Island Greening, Jonagold, Pacific Rose, Pink Lady, Red Delicious, and Rome. Most of these provide good sugar levels and some aromatics. A few, like Granny Smith, provide a bit of acidity.

Big box stores like Costco and Sam’s Club are great sources for apple juice at a budget price. The one-gallon size makes it easy to measure and pour into your sanitized fermenter. Ideally, look for juice that’s pasteurized (no added preservatives) and not from concentrate. Juice with ascorbic acid as a preservative also seems to work fine, and of course juice from concentrate is acceptable too; the not-from-concentrate juice just seems to have a brighter, fresher flavor.

Malted cider is so easy to throw together after an all-grain brew day, it’s almost a shame not to have a keg on tap. Just remember, if you are brewing for gluten-sensitive folks, you’ll have to skip the “malted” part and use 100 percent cider to have it be truly gluten-free. If going this route, don’t forget to add yeast nutrient per the manufacturer’s directions before fermentation.

Amahl Turczyn is associate editor of Zymurgy.

Quick & Easy Malted Cider

INGREDIENTS

for 5.25 U.S. gallons (20 L)

Final volume in the keg: 5 gallons (19.83 L)

4 gal	(15.14 L) 1.050 gravity apple juice
1 gal	(3.79 L) malted barley wort (preferably 1.040-1.050 gravity)
Sweetener (optional) – see text	
2 tsp	cream of tartar (see text)
2 12-oz	cans frozen apple (or other fruit) juice concentrate to back-sweeten

English ale yeast

Original Gravity: 1.050 (12.5° P)

Finishing Gravity: 1.004 – 1.006 (1 – 1.5° P), before back-sweetening

IBUs: 0

ABV: about 6%

Boil Time: 15 minutes (wort only)

DIRECTIONS

Boil 1 gallon (3.79 L) wort tailings at least 15 minutes. If wort is less than 1.050 OG, collect a greater volume and boil until target gravity is reached (or add unhopped malt extract or other sweeteners—see text. Just don’t add hops!). Pour apple juice into sanitized, 6.5-gallon (24.6 L) fermenter, splashing to aerate. Rack wort onto juice, make sure temperature equalizes at about 68° F (20° C), and pitch yeast. Ferment out completely, then wait until yeast begins to fall out and the cider starts to clarify. Rack off lees into sanitized keg, back-sweeten to taste, force carbonate to desired CO₂ level, and chill to serving temperatures of no higher than 40° F (4° C).

EXTRACT VERSION

Dissolve 1.4 lb (635 g) unhopped extra-pale malt extract syrup or 1.15 lb (522 g) extra-light dry malt extract and other sweeteners (if desired) into one gallon of water. Boil 15 minutes to sanitize. Pour apple juice into sanitized, 6.5-gallon (24.6 L) fermenter, splashing to aerate. Rack wort onto juice, make sure temperature equalizes at about 68° F (20° C) and pitch yeast. Ferment out completely, then wait until yeast begins to fall out and the cider starts to clarify. Rack off lees into sanitized keg, back-sweeten to taste, force carbonate to desired CO₂ level, and chill to serving temperatures of no higher than 40° F (4° C).



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by Amahl Turczyn

Fermentationland Competition



The second annual Fermentationland Homebrew Competition was judged December 5 at the Old Goat in Richmond, Maine. This fairly new event received 67 entries in 2015, and was hosted by the Maine Ale and Libation Tasters (MALT) homebrew club.

As vice president Chris Leavitt explained, the club is also fairly young but has shown enthusiasm and tenacity in bringing the spirit of amateur brewing competition to the state of Maine. "MALT has been around for about five years," Leavitt said. "We are located in central Maine and have about 20 members. We typically gather at a member's house or local homebrew shop. We try to meet at least every other month and always participate in AHA events such as Big Brew and Learn To Homebrew Day."

Club members have various levels of experience and range from extract to all-grain brewers, but as a group, they have embarked on some pretty ambitious projects since the club's inception. "A few years back, we acquired a 55-gallon whiskey barrel," Leavitt reported. "As a club,

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Kate's Kölsch

Recipe by Rodney Kibzey

Best of Show, Fermentationland Homebrew Competition

INGREDIENTS

for 5 U.S. gallons (18.93 L)

8.5 lb	(3.86 kg) Continental European Pilsner malt (94.4%)
0.5 lb	(227 g) wheat malt (5.6%)
1.25 oz	(35 g) Hallertau, 4.1% a.a. (FWH)
	Wyeast 2565 Kölsch yeast

Original Gravity: 1.049

Anticipated SRM: 3

Anticipated IBU: 24

Brewhouse Efficiency: 75%

Wort Boil Time: 75 min

DIRECTIONS

Use very soft water like that of Portland, Ore. Add 2 tsp gypsum in the mash and 2 tsp to the sparge water. Mash in with a protein rest at 122° F (50° C) and hold 15 minutes. Raise temperature to 149° F (65° C) and hold 60 minutes. Mash out at 168° F (76° C) for 10 minutes. Sparge at 168° F (76° C). Ferment at 60° F (16° C) for 10 to 12 days, then lager at 36° F (2° C) for four weeks.

EXTRACT VERSION

Substitute 6 lb (2.72 kg) Pilsner malt extract syrup for the Pilsner malt and 14 oz (397 g) wheat malt extract syrup for the wheat malt. Dissolve extract completely with RO or distilled water to desired boil volume and proceed with recipe as above.

Meat Cigar

RAUCHBIER

Recipe by Rodney Kibzey

First Place, Fruit and Smoked category, Fermentationland Homebrew Competition

INGREDIENTS

for 5 U.S. gallons (18.93 L)

5.0 lb	(2.27 kg) Bamberg Best Malz smoked malt (47.6%)
2.0 lb	(0.9 kg) German 8° L Munich malt (19%)
2.0 lb	(0.9 kg) German 3° L Vienna malt (19%)
0.75 lb	(340 g) Belgian caramel- Munich malt (7.1%)
0.25 lb	(113 g) dextrin malt (2.4%)
0.25 lb	(113 g) melanoidin malt (2.4%)
2.0 oz	(57 g) 400° L Carafa (1.2%)
2.0 oz	(57 g) Belgian aromatic malt (1.2%)
1.25 oz	(35 g) Hallertau pellets, 4.3% a.a. (60 min)
0.5 oz	(14 g) Hallertau pellets, 4.3% a.a. (15 min)
Wyeast 2124 Bohemian Lager yeast	

Original Gravity: 1.057

Anticipated SRM: 18

Anticipated IBU: 29

Brewhouse Efficiency: 75%

Wort Boil Time: 75 min

DIRECTIONS

Use very soft water like that of Portland, Ore. Add 2 tsp gypsum in the mash and 2 tsp to the sparge water. Mash in with a protein rest at 122° F (50° C) and hold 15 minutes. Raise temperature to 154° F (68° C) and hold 60 minutes. Mash out at 168° F (76° C) for 10 minutes. Sparge at 168° F (76° C). Ferment at 50 to 55° F (10 to 13° C) 10 to 12 days, then lager at 36° F (2° C) for four to six weeks.

EXTRACT VERSION

Due to smoked malt base grain bill, an extract version is not recommended.



Kate Jones and Rodney Kibzey.

we have filled it four times with various styles, including old ale and barleywine. After the barleywine, we purposely soured the barrel and fermented a Flanders red in it. It currently holds a lambic."

As far as the competition, the club wanted to start small. "In 2014, we thought it would be fun to run a small competition—no more than 100 entries," Leavitt said. The club soon discovered a common hurdle for competition organizers—finding a sufficient judging pool. "One of our members is a Beer Judge Certification Program (BJCP) judge and noticed there weren't a lot of opportunities in the Maine area for BJCP judges to judge and gain experience. We struggled to find available judges, so our sole judge decided he was going to set up a BJCP study group and run an exam. The exam was administered in late 2014, and three more of our members passed and became judges. Other people in the state also passed, which gave us a much better pool of judges to choose from for our 2015 competition." The competition had 10 judges ranging from Recognized to National rankings.

The nearly 70 entries received were in line with what could be expected for a competition in only its second year, but the top prize was a doozy—the Best of Show winner received not only a gold medal, but also the opportunity to brew his or her beer on the pilot system at a local Maine microbrewery, Geary's Brewing.

While the Best of Show award went to an out-of-state brewer—veteran homebrewer Rodney Kibzey of the Oregon Brew Crew—

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Photo courtesy of Rodney Kibzey

Leavitt and MALT were graciously accommodating. "Since the winner is not from the state of Maine, he can either give us the recipe and we can brew it at Geary's, or he can pass [the opportunity] to the runner-up." The beer will then be served at a local pub.

Kibzey's winning entry was a Kölsch, while runner-up Harold Siefken of MALT brewed an American IPA. Jason Chang rounded out the top three with his Hill 364 American pale ale.

Kibzey, who currently lives in Portland, has been with the Oregon Brew Crew since 2013 after residing in Chicago for 18 years. He started homebrewing in 2002 and became a BJCP Certified judge in 2003. He has judged more than 100 competitions, locally and nationally, and has organized two competitions himself, each with more than 500 entries. His favorite beers to brew (and judge) are German, American, and English styles.

Kibzey showed early promise at homebrew competitions, with success in the very first one he ever entered. He has since gone on to win numerous awards in the U.S. and

Canada, including winning the Samuel Adams LongShot American Homebrew Competition twice (he is the only two-time winner), Midwest Homebrewer of the Year, and National Homebrew Competition Meadmaker of the Year.

Kibzey was happy to share not only the

specifics for his winning Kate's Kölsch, named for girlfriend Kate Jones, but his somewhat infamous rauchbier recipe, Meat Cigar (also known as Bacon Cigar in the Fermentationland results).

Amahl Turczyn is associate editor of Zymurgy.

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KUDOS—BEST OF SHOW

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October 2015

Okmulgee Harvest Spoon Chili Festival, 3 entries—Luke Hadsall, Oklahoma City, OK
3rd Annual Delaware Home Brew Championship, 45 entries—Bryan Walker, Milford, DE
Winnipeg Brew Bombers Pro Am Brew Challenge 2015, 278 entries—Jimmy Bernier, Québec, QC
28th Annual Southern California Homebrew Championship, 371 entries—Aaron Schwarzkopf
2015 BrewUnited Challenge, 309 entries—Aaron Curtis, Houston, TX
Greater Topeka Hall of Foamers Brew Bash, 148 entries—Rodney Kibzey, Portland, OR
Hoppy Halloween 18 - Witch's Brew, 500 entries—Keith Brady, Eden Prairie, MN
McKenzie Cider & Craft Beer Festival Homebrew Competition, 37 entries—Charles Macaluso, Portland, OR
Grim Reaper Challenge, 12 entries—David McCampbell, Salmon, ID

November 2015

Motown Mash, 330 entries—Steven Landgren, Webster, NY
Santa Fe Open, 284 entries—Ted Gisske, Mount Horeb, WI

Son of Brewzilla Homebrew Competition, 400 entries—Jim Jadwisiak and Cara Baker, Cleveland, OH
Tulare County Homebrew Competition, 39 entries—Robert Morris and Phil Routon, Visalia, CA
B.A.M.M. Inaugural Home Brew Competition, 9 entries—Iсаac Trowbridge, MI
Music City Brew Off, 317 entries—Kirk Hutcherson, Murfreesboro, TN
Skirmish, 289 entries—Trey Lovelace, Charlotte, NC
Southern Season Homebrew Competition, 35 entries—Dylan Elks, Wilmington, NC
Concurso Sul Matogrossense de Cerveja Caseira, 13 entries—Thiago Wormsbecher, Campo Grande
M.A.L.T. 2015, 249 entries—Parker Willfong, Regina, SK
California State Homebrew Competition, 371 entries—Jeffrey Temple, Wilton, CA
Any BJCP Style with OG = 1.070, 8 entries—Bennett Cowan, Bristol, TN
Fall Brew Review, 35 entries—Keith Brady, Minneapolis, MN
Gino's East Dubbel Judging, 13 entries—John Gammal, Chicago, IL

Monster Homebrew Competition, 31 entries—Pam and Keith Bradley, Austin, TX
Dias Oscuro, 84 entries—Chris Goodwin, CO
National Homebrew Championships - Southern Prelim, 32 entries—Paul de Beer, Cape Town
BrewDat!, 25 entries—Kevin Bergeron
Fall Throwdown, 64 entries—Matt O'Dwyer, Seoul, South Korea
Heretic Rally Wort Competition, 30 entries—Peter Ringenberg, Martinez, CA
Star City Homebrew Throwdown, 74 entries—Joe Darden, Chantilly, VA
Wasser Homebrewing Competition, 2 entries—Taylor Brummett, Greencastle, IN
2015 Thanksgiving Harvest Homebrew Competition, 28 entries—Ed Ivanov, Dracut, MA
SA National Homebrew Championship North Round, 66 entries—JP Lewtak, Bloemfontein
FOAM Cup, 520 entries—Keith Wright, Edmond, OK
Beer for Boobs V, 329 entries—Keith McFarlane, Munroe Falls, OH
Land of the Muddy Waters, 226 entries—Tim Thomassen, Lincoln, NE
MALT Turkey Shoot, 182 entries—Mike Drago, Richmond, VA
SCH-ABC 8, 324 entries—Joshua Weikert
'Merica's Mug, 55 entries—Tad Kays, Roswell, GA
SD Homebrew Festival, 31 entries—Justin Kleffman, San Diego, CA
Long Island Beer and Malt Enthusiasts 3rd Annual Beer, Mead, & Cider Competition, 150 entries—John Dispirito, Long Island, NY
Butler Homebrew BASH, 168 entries—Andy Weigel, Munhall, PA
Not Beer (Mead & Cider), 17 entries—Jeff McGrath
David City Brew Ha Ha, 27 entries—Brian Haas, Norfolk, NE
4to. Concurso Cerveceros Santafesinos "Leandro Laferriere," 15 entries—Daniel Alessandro, Santa Fe, Argentina
5 Paddles Brewing Co.'s, 240 entries—David Ronneberg, Canada, AB
Black Friday Homebrew Competition (Black Beer Only), 101 entries—Jeremiah Peterson, London
Best of Boston Homebrew Competition, 180 entries—Graeme Robinson, Stow, MA
3rd Annual Big Spruce Home Brew Challenge, 45 entries—Eric Gautier and Justin Clarke, Nova Scotia
IV Concurso Paranaense de Cerveja Feita em Casa, 192 entries—Marlon Hammes, Curitiba, PR
SA National Homebrew Championship Final Round, 31 entries—JP Lewtak, Bloemfontein
The Great Quintessential English Ales Competition, 40 entries—Jakub Scheibe, Dublin

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KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

December 2015

- Humpy's Big Fish Homebrew Competition, 63 entries—*Britt Reed, Eagle River, AK*
- Annual Brewster's Cup Mead Competition, 6 entries—*Joe Harrington, Dayton, OH*
- IV Concurso Estadual da Acerva Gaucha, 88 entries—*Juliano De Oliveira Dias, Porto Alegre, RS*
- CiderDays Amateur Cider Competition, 61 entries—*Tyler Graham, Brooklyn, NY*
- 2015 THIRSTY Classic, 113 entries—*Paul Kay, Burlington, IA*
- Pennsylvania Homebrew Open Competition, 151 entries—*Ryan Rosendale, State College, PA*
- HOPOFF Home Brewing Competition - Stout, 10 entries—*Isaac Claypool, Grove City, OH*
- 2nd Annual Fermentationland Homebrew Competition, 67 entries—*Rodney Kibzey, Portland, OR*
- Palmetto State Brewers Open (PSBO), 372 entries—*Dexter Garner, Winston-Salem, NC*
- Stout Wars, 43 entries—*Steven Park, Seoul*
- KLOB KUP, 14 entries—*Bill Blakeslee, Kalamazoo, MI*
- ABQ Beer Holiday Fiesta, 162 entries—*Lynne Waggoner, Albuquerque, NM*
- Primer Concurso Somos Cerveceros 2015-2016, 126 entries—*Alejandro Alfano*
- Brasseurs Royale 2015, 49 entries—*Wayne Odom, Prairieville, LA*
- Nielsen Massey Homebrew Challenge, 35 entries—*Eileen Uchima, Naperville, IL*
- Copa Cervezas Garage UC 2015, 89 entries—*Carlos Farias, Santiago*
- Happy Holidays Homebrew Competition, 540 entries—*Ilan Alpert, Columbia, MD*
- Brew and Grow's Battle of the Brewers 2: Darkside of the Brews, 193 entries—*Amy Wagner, Arlington Heights, IL*
- Hogtown Brewers Fall Intraclub Competition, 19 entries—*Jim Barrie, Gainesville, FL*
- Local Homebrew Competition: Go Pro for SFBW 2016, 62 entries—*Trevor Martens, Berkeley, CA*
- Battle of the Brews, 88 entries—*Tony Arruda, Ann Arbor, MI*
- Competencia Winter Beer Fest Chihuahua 2015, 49 entries—*Ramon Eduardo Zambrano Montes, Chihuahua*
- Concurso interno Dunkelweizen 3CZN, 6 entries—*Anibal Loggia, Leonardo A Taboada, Garin, Jose C Paz*

AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

For complete calendar, competition and judging information go to HomebrewersAssociation.org/ pages/competitions



March 4

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quaff.org

March 5

Lethbridge Werthogs 17th Annual WettContest

Lethbridge, Alberta, Canada. Entry Deadline: 2/26/2016
werthogs.com

March 5

Concurso HomeBrew ACCE M16

Madrid, Spain. Entry Deadline: 2/28/2016.
m16.cerveceros-caseros.com

March 5

BABBLE Brew Off

Gurnee, IL. Entry Deadline: 2/20/2016.
brewoff.brewcomp.com

March 5

National Brewing Championships

Dublin, Ireland. Entry Deadline: 1/31/2016.
nationalhomebrewclub.ie/competition/

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**AHA/BJCP SANCTIONED
COMPETITION PROGRAM CALENDAR**

For complete calendar, competition and judging information go to
HomebrewersAssociation.org/pages/competitions



March 5

Jeff Sanders Memorial

Torrance, CA. Entry Deadline: 2/20/2016

March 5

Shamrock Open XXI

Raleigh, NC. Entry Deadline: 2/20/2016.

carboyclub.com/shamrock-competition

March 6

Barcelona Beer Challenge

Barcelona, Spain. Entry Deadline: 1/6/2016.

barcelonabeerchallenge.com/?lang=en

March 7

Bockfest

Cincinnati, OH. Entry Deadline: 2/26/2016.

bockfest.brewcomp.com

March 9

Rocket Rod's Kona Homebrew Contest

Kailua Kona, HI. Entry Deadline: 2/27/2016.

sites.google.com/site/konabrewcontest/Home-Page

March 11

AHA National Homebrew Competition

1st Round - Indianapolis

Indianapolis, IN. Entry Deadline: 3/9/2016.

HomebrewersAssociation.org

March 11

Snake Saturday Irish Only Competition

North Kansas City, MO. Entry Deadline: 3/4/2016

March 12

26th Annual Hudson Valley Homebrewers Competition

Poughkeepsie, NY. Entry Deadline: 3/4/2016.

vhvb.brewcomp.com

March 12

2016 Peak-to-Peak ProAm

Longmont, CO. Entry Deadline: 3/4/2016.

indianpeaksalers.org

March 12

2016 Bluebonnet Brewoff

Irving, TX. Entry Deadline: 1/28/2016.

bluebonnetbrewoff.org

March 12

ISB - Summer Lovin' Homebrew Competition

Sydney, Australia. Entry Deadline: 2/27/2016.

colbart.wix.com/isbbrewcomp

March 12

March Mashness

St. Cloud, MN. Entry Deadline: 2/28/2016.

cloudytownbrewers.org/competition

March 12

Scorpion Homebrew Competition

Owings, MD. Entry Deadline: 3/5/2016.

scorpion.brewcompetition.com

March 12

Drunk Monk Challenge

Aurora, IL. Entry Deadline: 3/5/2016.

knaves.org/DMC/index.html

March 12

Márciusi sörforradalom

Budapest, Hungary. Entry Deadline: 2/28/2016.

competition.elosor.hu

March 12

Bridging the Gap Homebrew Competition

Davis, CA. Entry Deadline: 2/29/2016.

greenbeltbrewers.org/bridgingthegap/

March 18

6th Copa Cerveceros Caseros de Chile

Santiago, Chile. Entry Deadline: 3/11/2016.

minicerveceria.cl/sitio/index.php

March 18

Wizard of Saaz 9

Akron, OH. Entry Deadline: 3/4/2016.

saazakron.com/WoS/

March 18

AHA National Homebrew Competition

1st Round - Saint Louis

Saint Louis, MO. Entry Deadline: 3/9/2016.

HomebrewersAssociation.org

March 18

AHA National Homebrew Competition

1st Round - Seattle

Seattle, WA. Entry Deadline: 3/9/2016

HomebrewersAssociation.org

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March 18
AHA National Homebrew Competition
1st Round - New York City
Astoria, NY. Entry Deadline: 3/9/2016
HomebrewersAssociation.org

March 19
Mazer Cup International Home Competition
Broomfield, CO. Entry Deadline: 3/4/2016.
mazercup.com

March 19
SNAFU Winterfest
Las Vegas, NV. Entry Deadline: 3/11/2016.
snafubrew.com

March 19
St Patrick's Day Homebrew Contest
Winona, MN. Entry Deadline: 3/11/2016.
bluff.coop/homebrewcontest/

March 19
Tuscaloosa Home Brew Competition
Tuscaloosa, AL. Entry Deadline: 3/5/2016

March 20
Athens Homebrew Classic
Athens, GA. Entry Deadline: 2/15/2016.
homebrewclassic.com

March 22
Quarterly Brewing Challenge by the Homebrew Emporium
Cambridge, MA. Entry Deadline: 3/13/2016.
beerbrew.com/QBC/

March 26
Charlie Orr Memorial Chicago Cup Challenge
Crest Hill, IL. Entry Deadline: 3/12/2016.
bossbeer.org/ChicagoCup

March 26
Los Angeles Belgian Brew Challenge
Los Angeles, CA. Entry Deadline: 3/12/2016.
belgianbrewchallenge.com

March 26
Lager, Lager Everywhere, and Not an Ale to Drink
Everett, WA. Entry Deadline: 3/20/2016.
lagercomp.beerrenegades.com

March 26
DC Homebrewers Cherry Blossom Competition
Washington, DC. Entry Deadline: 3/13/2016.
dchbcompetition.com

April 1
AHA National Homebrew Competition
1st Round - Nashville
Nashville, TN. Entry Deadline: 3/9/2016
HomebrewersAssociation.org

April 1
AHA National Homebrew Competition
1st Round - Austin
Austin, TX. Entry Deadline: 3/9/2016
HomebrewersAssociation.org

April 2
Great Arizona Homebrew Competition
Phoenix, AZ. Entry Deadline: 3/24/2016.
brewarizona.org

April 2
World Cup of Beer
Alameda, CA. Entry Deadline: 3/9/2016.
worldcupofbeer.com

April 3
Lagerpalooza 2
Salt Lake City, UT. Entry Deadline: 3/28/2016.
saltcitybrewsupply.com/beercomp

April 8
AHA National Homebrew Competition
1st Round - San Diego
San Diego, CA. Entry Deadline: 3/9/2016
HomebrewersAssociation.org



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For complete calendar, competition and judging information go to
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April 8

AHA National Homebrew Competition

1st Round - Denver

Denver, CO. Entry Deadline: 3/9/2016

HomebrewersAssociation.org

April 8

AHA National Homebrew Competition

1st Round - Philadelphia

Montgomeryville, PA. Entry Deadline: 3/9/2016

HomebrewersAssociation.org

April 9

**Los Angeles International Beer
Competition**

Pomona, CA. Entry Deadline: 3/16/2016.

labeercomp.com/wos/beer_competition/

April 9

**6th Annual Ocean State Homebrew
Competition**

Providence, RI. Entry Deadline: 3/15/2016.

oshc.brewcomp.com

April 9

Battle of the Brews

Santa Rosa, CA. Entry Deadline: 4/1/2016.

battleofthebrews.com

April 9

Tercer Concurso Andaluz de Homebrewer

Sevilla, Spain. Entry Deadline: 3/4/2016.

fabricarcerveza.es/blog/item/181-3-concurso-andaluz-de-homebrewer

April 10

Emerald Coast Spring Break Challenge

Navarre, FL. Entry Deadline: 3/26/2016.

yeoldebrothersbrewery.com/special-events.html

April 15

AHA National Homebrew Competition

1st Round - Sacramento

Sacramento, CA. Entry Deadline: 3/9/2016

HomebrewersAssociation.org

April 15

AHA National Homebrew Competition

1st Round - Saint Paul

Saint Paul, MN. Entry Deadline: 3/9/2016

HomebrewersAssociation.org

April 16

Nebraska Shootout

Omaha, NE.

lincolnlagers.com/shootout/

April 16

South Shore Brewoff 2016

Mansfield, RI. Entry Deadline: 3/26/2016.

southshorebrewclub.org

April 16

Lowcountry Showdown

Ridgeland, SC. Entry Deadline: 4/9/2016.

brewcompetition.com

April 23

COHO Spring Fling

Bend, OR. Entry Deadline: 4/15/2016.

cohomebrewers.org/springfling

April 23

Brewfest at Mount Hope

Manheim, PA. Entry Deadline: 4/9/2016.

parentfaire.com

April 24

20th Annual Chico Homebrew

Competition

Chico, CA. Entry Deadline: 4/16/2016.

chicohomebrewclub.com

April 30

London and South East Craft Brewing

Competition and Festival

London, UK. Entry Deadline: 4/10/2016.

londonandsoutheast.brewcompetition.com

April 30

20th Annual Cascade Brewers Cup

Woodinville, WA. Entry Deadline: 4/24/2016.

cascadebrewersguild.com

April 30

Mead Free or Die

Londonderry, NH. Entry Deadline: 4/15/2016.

meadfreeordie.com

May 7

Alameda County Fair Homebrew

Competition (BABO)

Pleasanton, CA. Entry Deadline: 4/14/2016.

beercomps.org/babo

May 12

BrewMaui Annual Home Brew Contest

Maui, HI. Entry Deadline: 5/10/2016.

brewmaui.com

May 14

Buzz Off 22

Downtown, PA. Entry Deadline: 4/29/2016.

sites.google.com/site/buzzhomebrewclub/buzzoff

May 14

4th Annual Heart of Cascadia

- The Colors of IPA!

Portland, OR. Entry Deadline: 5/6/2016.

hoc2016.oregonbrewcrew.org

May 14

Boston Homebrew Competition

Boston, MA. Entry Deadline: 4/29/2016.

bhc.wort.org

May 14

Brewnoses' Homebrew Competition 2016

Halifax, Nova Scotia, Canada. Entry Deadline:

5/7/2016.

brewnoses.org

May 15

Singapore HomeBrew Charity Cup

Singapore. Entry Deadline: 5/1/2016.

May 19

California State Fair Homebrew

Competition

Sacramento, CA. Entry Deadline: 5/6/2016.

northerncalbrewers.com

May 21

The 2016 Hogtown Brew-Off

Gainesville, FL. Entry Deadline: 5/7/2016.

hogtownbrewers.org/brewoff/

May 21

4th Annual Hop Blossom

Homebrew Competition

Winchester, VA. Entry Deadline: 5/6/2016.

shenbrew.org/hop_blossom_16/

May 21

OC Fair Homebrew Competition

Costa Mesa, CA. Entry Deadline: 4/29/2016.

ocfair.com/competitions/

May 21

Carolina BrewMasters US Open

Charlotte, NC. Entry Deadline: 5/13/2016.

usopen.carolinabrewmasters.com

May 22

21st Annual Big Batch Brew Bash

Houston, TX. Entry Deadline: 5/13/2016.

thekgb.org

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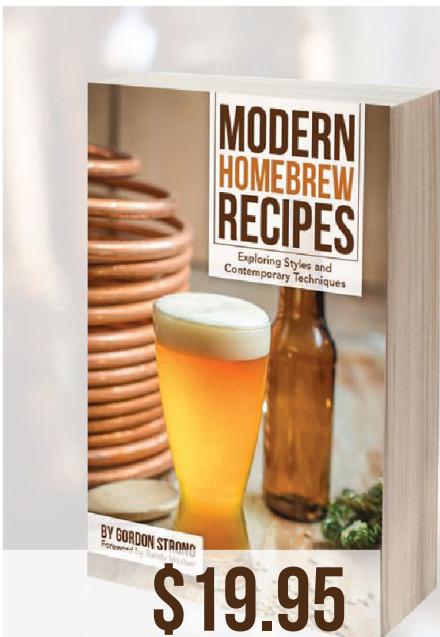
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ABOUT THE AUTHOR

Three-time winner of the American Homebrewers Association Ninkasi Award, **Gordon Strong** is president and highest ranking judge in the Beer Judge Certification Program, and principal author of the BJCP Style Guidelines.



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Gluten-Free Beer

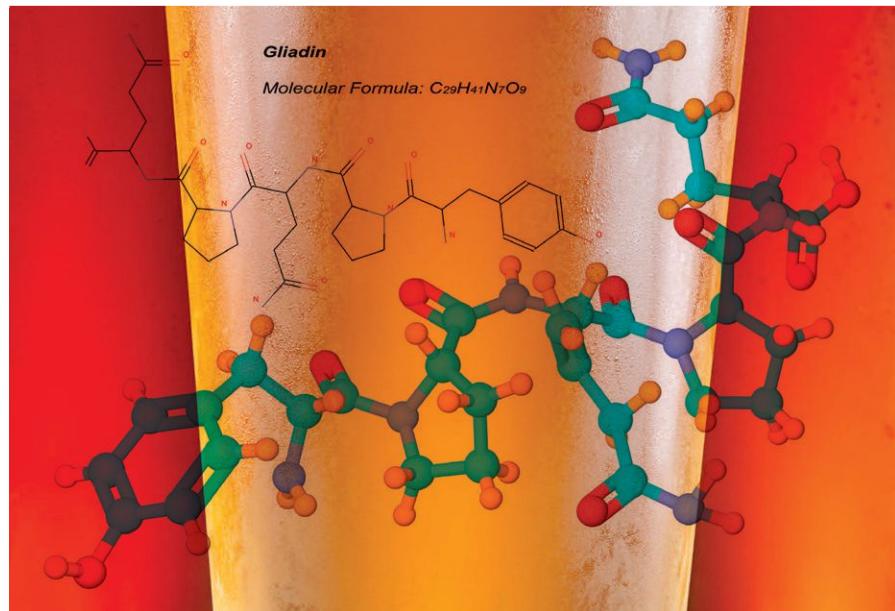
Barley is a member of the grass family, sub-family Pooideae, belonging to the tribe Triticeae, along with wheat and rye. Oats are from a different tribe (Avena), as are rice (Oryzeae) and corn (Andropogoneae), but all of these cereal grains are used in making beer.

Several conditions can affect people who experience a reaction to beer. One is an allergic reaction to barley, which may or may not be associated with gluten. People can be allergic to barley just as they can to wheat, horses, eggs, and peanut butter. There are two dozen different allergens in wheat, of which gluten is only one. However, individuals can also be specifically sensitive to gluten, which can manifest in several ways. One is a straight allergic reaction—watery eyes, runny nose, and respiratory problems. A second is a “gluten rash,” a type of dermatitis caused by an autoimmune response.

Celiac disease is a serious autoimmune disease that damages the mucosal layer of the small intestine and its ability to absorb nutrients, and reportedly can cause melanoma and other cancers. Typical initial symptoms include gastrointestinal distress. Gluten sensitivity or intolerance can cause symptoms similar to celiac disease but without damage to the small intestine. Sufferers of celiac disease have an immunoreactive response to gliadin, a prolamin (polypeptide) in wheat that combines with other wheat proteins (such as glutenin/glutenin) to form gluten, which gives bread dough both elasticity and structure.

Gluten in Beer

Twenty different amino acids serve as building blocks for construction of larger structures. A polypeptide is the result of several amino acids joined together using peptide bonds. Proteins are con-



SUFFERERS OF CELIAC DISEASE HAVE AN IMMUNOREACTIVE RESPONSE TO GLIADIN, A PROLAMIN IN WHEAT THAT COMBINES WITH OTHER WHEAT PROTEINS TO FORM GLUTEN, WHICH GIVES BREAD DOUGH BOTH ELASTICITY AND STRUCTURE.

structed of one or more polypeptides and have different properties and functionalities based on their physical structure. Proteins are characterized based on their solubility in the laboratory: albumins are soluble in water, globulins are soluble in dilute salt solutions, prolamins are solu-

ble in alcohol solutions, and the remainder are categorized as glutelins. Cereal chemists organize barley proteins into two main groups: storage and non-storage, based on their location and function within the kernel. Storage proteins serve as peptide and amino acid reservoirs for the embryo, and include hordeins (prolamins) and globulins. Non-storage proteins are the structural proteins and enzymes, and include albumin, glutelin, and globulin types.

During malting, the endosperm protein matrix is hydrolyzed into polypeptides, oligopeptides, and free amino acids. These proteins are a mixture of hordeins (prolamin proteins) and to a lesser extent, glutelin proteins. The hordeins are the primary component of the protein matrix surrounding the starch granules, and it is the breakdown of this matrix during germination that provides the vast majority of free amino nitrogen (FAN) to the wort. The non-storage proteins are the source of the enzymes present in barley before

malting, such as beta amylase, and albumins such as protein Z, a primary foaming agent in beer.

Gliadin is structurally very similar to hordein in barley and secalin in rye. About 10 percent of celiac sufferers exhibit an immunoreactive response to avenin in oats and corn (maize). All are considered prolamins, i.e. alcohol-soluble storage proteins with a high proportion of the amino acids glutamine and proline in the primary sequence of the polypeptide chain. This is the reason that although barley doesn't

technically contain gliadin, beer can still be a problem for people with gluten sensitivity. Celiac sufferers can be sensitive to any of these prolamins, but gliadin and hordein account for 90 percent of immunoreactive responses in T-cell testing. Oats contain much less prolamin (i.e. avenin) than wheat, barley, or rye, and this may be why many celiac sufferers do not react to oats; it may be that they are less sensitive to prolamins in general and only react to particular types. There are in fact several hundred polypeptides within each prolamin group that are immuno-

reactive; to frame this discussion another way, it is like saying that fish, mammals, and reptiles are all dangerous man-eaters because they have large teeth.

Prolamins and Beer Haze

Beer haze, including chill haze, is a combination of haze-active proteins and haze-active polyphenols that come together via hydrogen bonding to create large, visible molecules. Hydrogen bonding is strongest at colder temperatures. At warm temperatures, the component molecules are vibrating too much for the weak hydrogen bonds to hold the complex together, and that's why chill haze disappears as the beer warms. With time, these complexes can oxidize and polymerize into permanent haze.

What does "haze-active" mean? Basically it refers to the type and size of these proteins and polyphenols. Haze-active proteins are of the same size class as foam-active proteins and are typically hordeins. It appears that the hydrogen bonding between haze-active polyphenols and proteins occurs at the proline sites in the polypeptide chains.¹ These haze-active proteins can be broken down into non-haze-active sizes by protease enzymes such as papain (a papaya-based proteolytic enzyme commonly used as meat tenderizer), but those enzymes also break down the foam-active proteins, which is obviously a problem.

Larger polyphenols form larger protein complexes and can settle out as hot and cold break, while the smaller polyphenols are carried over into the final beer. As mentioned previously, these small polyphenols can grow by polymerization, especially in the presence of oxygen. If a beer with chill haze was poorly handled during bottling, oxygen can cause the chill haze to become permanent haze. The point is that the basis for haze, at least in part but perhaps a majority, is the hydrogen bonding at proline sites in hordeins.

Enzyme Clarifiers

Two main categories of enzyme degrade barley endosperm proteins during malting. The first are endoproteases and endopeptidases, which act to break up the protein molecules from inside the structure. There are at least 40 such enzymes

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involved in this stage.² The second group are exoenzymes, such as carboxypeptidase, that produce individual amino acids from the carboxyl ends of the peptide chains (i.e. outside the structure). To clarify, peptides are proteins or protein segments that are smaller than polypeptides, which are affected by protease-class enzymes, but larger than amino acids.

Proline-specific endoproteases, such as Brewers Clarex™ from DSM and Clarity Ferm from White Labs, act by cleaving the haze-active proteins (typically hordeins) at the proline segments in the chain, reducing them to non-haze-active sizes (polypeptides into peptides). The proline sites of the peptides will still bond with haze-active polyphenols, but the size of the complex can't grow to form a haze. Thus, a probable majority of beer haze is prevented by the use of these enzymes.

This type of enzyme has the added benefit of breaking up the hordein/gliadin/secalin protein structures that form gluten. Industry studies have shown that beer treated with this enzyme measured less than 20 ppm gluten based on the R5 Mendez Competitive ELISA assay. Further analysis by concomitant mass spectrometry of the proteolytic residues also indicated that the residues would be nonimmunoreactive.³ However, even though less than 20 ppm of gluten is the current benchmark for considering a food to be gluten-free, there is enough variation among people with gluten-related allergies that marketing a beer as gluten-free may be impossible from a legal liability standpoint. For example, in the case of one celiac patient, the consumption of 1 mg of gluten per day from a communion wafer was sufficient to prevent mucosal recovery (i.e. caused inflammation) of the small intestine.³ Avoiding the wafer allowed recovery within six months.

Confounding the issue is the fact that the current antibody tests target only a handful of the hundreds of gluten proteins that can cause immunoreactions, and those tests are calibrated on commercial wheat gliadin, which is not representative of barley hordein that has been malted, mashed, and boiled.

According to an article in the *Journal of the American Society of Brewing Chemists*,³ “Definitive evidence of the safety of treated beer for celiacs ideally requires a double-blind crossover dietary challenge. In this experiment, the effect on circulating T-cells (4) and mucosal appearance (71) of a large number of celiacs, including sensitive subjects, who have been challenged with either PEP-treated beer or untreated beer followed by a crossover to the other treatment regime, would provide convincing evidence for the efficacy of *A. niger* PEP on eliminating gluten peptides for the whole celiac population. In

order to achieve this, subjects would have to drink 10 L of an average beer (at 100 ppm) per day to consume sufficient hordein (1 g) for a useful short-term challenge. Sourcing volunteers for such an experiment may not be a problem, but ethics approval would be unlikely.”

In other words, achieving FDA “gluten-free” status for barley, wheat, and rye-based beers treated with proline-specific endoproteases is challenging at best. Nonclinical experimental approval would require isolation and identification of hundreds of prolamin

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A photograph of a Picobrew brewing system. The central unit is a stainless steel mashing tun with a clear front panel showing grains inside. To its right is a tall, black cylindrical keg. In the background, there are more stainless steel tanks and pipes, typical of a brewery setup.

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polypeptides that could cause an immuno-reactive response, and characterization of those and their post-treatment residues by concomitant mass spectrometry, high performance liquid chromatography (HPLC), and other tests. Currently, beers treated by proline-specific endoproteases are being marketed as "gluten-reduced" or "crafted to remove gluten."

References

1. Siebert, Karl J and P.Y. Lynn. "Mechanisms of Beer Colloidal Stabilization." *J.Am.Soc.Brew.Chem.* 55(2):73-78, 1997.
2. Bamforth, Charles W. *Scientific Principles of Malting and Brewing*. American Society of Brewing Chemists, p. 54.
3. Tanner, G.J., et al. "Gluten, Celiac Disease, and Gluten Intolerance and the Impact of Gluten Minimization Treatments with Prolylendopeptidase on the Measurement of Gluten in Beer." *J. Am. Soc. Brew. Chem.* 72(1):46 of 36-50, 2014.

John Palmer is the author of *How to Brew*.



American Homebrewers Association® 2016 Governing Committee Election

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HomebrewersAssociation.org/vote

Candidates

Please read candidate statements at HomebrewersAssociation.org and cast your ballot online. For the 2016 election, there are four candidates running for two open seats.



Fred Bonjour



Denny Conn



Betty Dehoney



George West

Election Guidelines

Balloting is online.

Go to HomebrewersAssociation.org, read the candidate statements, and cast your vote. Vote for up to two (2) 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.

All ballots must be submitted before midnight Pacific time, March 31, 2016

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 11, 2016 at the AHA Homebrew Con in Baltimore, Md.



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



Two pale, super saisons were sent to our judges for this issue. According to the BJCP 2015 Style Guidelines, saison is described as “a pale, refreshing, highly-attenuated, moderately-bitter, moderate-strength Belgian ale with a very dry finish. Typically highly carbonated, and using non-barley cereal grains and optional spices for complexity, as complements the expressive yeast character that is fruity, spicy, and not overly phenolic. Less common variations include both lower-alcohol and higher-alcohol products, as well as darker versions with additional malt character.”

The guidelines differentiate three different strengths of saison based on ABV. Table strength saisons range from 3.5 to 5 percent; standard saisons are 5 to 7 percent; and super saisons are 7 to 9.5 percent. In addition, the guidelines also specify color requirements, with 5 to 14 SRM considered “pale” and 15 to 22 SRM considered “dark.”

Checking in at 7.3 percent, Great Divide’s Colette is a year-round release available in both bottles and cans (cans were sent to our judges). The Denver-based brewery describes Colette as “fruity and slightly

OUR EXPERT PANEL David Houseman, a Grand Master V level judge and competition director for the BJCP from Chester Springs, Pa.; Beth Zangari, a Grand Master II 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 IX judge, principal author of the BJCP Style Guidelines, and president of the BJCP board who lives in Beavercreek, Ohio.



Great Divide Brewing Co.
greatdivide.com

Boulevard Brewing Co.
boulevard.com

BJCP Style Guidelines
bjcp.org

Commercial Calibration Index
HomebrewersAssociation.org/pages/zymurgy/commercial-calibration

tart, with a dry finish.” Colette is brewed with barley, wheat, and rice, and fermented with a special blend of four different yeast strains. The brewery recommends pairing it with a charcuterie plate, foie gras, Indian curry, or Camembert cheese.

Boulevard Brewing Co.’s Tank 7 Farmhouse Ale, available year-round in bottles, is at the upper end of the “super” strength at 8.5 percent. Brewed with pale malt, malted wheat, and flaked corn, Tank 7 has fruity aromatics, grapefruit-hoppy notes, and a peppery, dry finish, according to the Kansas City, Mo.-based brewery. Boulevard recommends pairing Tank 7 with herb-roasted chicken, pork, and Taleggio cheese.

THE SCORES



Colette—Great Divide Brewing Co., Denver, Colo.
BJCP Category: 25B, Saison



DAVE HOUSEMAN

THE JUDGES' SCORES FOR COLETTE



BETH ZANGARI



SCOTT BICKHAM



GORDON STRONG

Aroma: Spicy, peppery aroma in the foreground with some grassiness up front that dissipates. Pils malt has a slightly sweet, crackery note. Fruity and pear-like fermentation esters with light lemon notes. Slight, off-putting egg-like aroma; likely DMS. Moderate ethanol aroma. No diacetyl. (8/12)

Appearance: Bright yellow color with a good deal of haze, verging on cloudy, similar to a witbier; OK for style. Big, rocky, white, long-lasting head. (3/3)

Flavor: Peppery phenols and pleasant esters, including lemongrass-like notes. Pils malt sweetness finishes dry with balancing hop bitterness. Low, spicy hop flavor. Bitterness lingers in the aftertaste. Some ethanol notes. No DMS. No diacetyl. (16/20)

Mouthfeel: Dry, fully-attenuated mouthfeel. Lingering bitterness without astringency. Medium to medium-light body. Slight alcohol warming. Creamy, fluffy texture. Not quite as carbonated as some examples, but adequate. (5/5)

Overall Impression: Very nice example of a saison that's quite drinkable and balanced. Nicely dry with peppery phenols and lemony esters creating a refreshing beer. I found the egg-like notes in the aroma somewhat problematic but they dissipated while drinking; likely DMS not showing up in the flavor. This beer (like most saisons) and Thai food are meant for each other. (8/10)

Total Score: (40/50)

Aroma: Moderate clove and cracked black pepper spiciness, backed by more pronounced pineapple, pear, and peach esters. Crackery malt with a hint of earthy, herbal hops; a wisp of DMS on first pour dissipates quickly. (7/12)

Appearance: Brilliant straw. Loosely formed head rises to half the glass, then gradually falls to clusters of white bubbles on the surface. (3/3)

Flavor: Pineapple and bubblegum at first, with pronounced biscuit and graham malt support. Clove-like phenols and low, peppery, spicy, herbal hop character give way to the dominant pineapple fruitiness mid-palate. Low hop bitterness and an herbal note balance rich sweetness; a light tart note adds an accent. (16/20)

Mouthfeel: Medium bodied with a moderately soft carbonation for a silky texture. Somewhat crisp finish lingers with a low alcohol warmth. (4/5)

Overall Impression: Starts crisp and inviting with spicy accents and graham maltiness. Pronounced fruit and bitterness with tart accent melds through the sips. Carbonation seems to gradually dissipate, and the second pour shows some yeast sediment, which adds to a somewhat rustic character. Goes well with blue cheese and figs. (8/10).

Total Score: (38/50)

Aroma: Moderately strong white pepper and clove phenols. Sharp carbonic acid masks the aromatics, but pear esters, banana, and bubblegum emerge. Some lemony notes. Pils malt character provides a light, sugary sweetness. (10/12)

Appearance: Very pale straw color—could be mistaken for a Belgian witbier. Creamy white head with impressive stability. Slight haze is acceptable for this style. (3/3)

Flavor: Soft, sweet honey notes from the malt, slowly yielding to yeast character. Short burst of soapiness could be from coriander or citrus rind. Pepper and spicy phenols are more restrained on the palate, which instead focuses on lemon and tangerine notes. Moderate hop bitterness enhances the phenol character, providing a fairly dry, crisp finish. Tart and refreshing. (16/20)

Mouthfeel: Creamy texture; carbonation level is perfect, not prickly. A slight soapiness, as noted above, with some warmth from ethanol. Very low astringency. (5/5)

Overall Impression: Excellent example of the widely varying saison style, with a complex aroma marked by classic peppery phenols transitioning to citric notes. Malt character adds supporting honey notes. Great job on the carbonation and conditioning, especially in a can. The only detraction was the slight soapy character. (8/10)

Total Score: (42/50)

Aroma: Spicy, pepper, and alcohol notes; moderately strong. Moderate fruity notes like citrus rind follow. Neutral, grainy malt in the background. Complex aroma evolves, with spiciness most prominent. Medium-low, earthy-floral hops. Slight yeasty. (10/12)

Appearance: Pale yellow color, like a hefeweizen. Big rocky white head, but with only fair retention. Quite hazy. Effervescent. (2/3)

Flavor: Initially malty with a grainy character. Finishes dry with medium-high bitterness. Medium-high spiciness; peppery, but this character is somewhat masked by the maltiness. Peppery aftertaste with clean malt. Moderate hop flavor, earthy-spicy. Medium to medium-low fruity notes, again like citrus peel. (15/20)

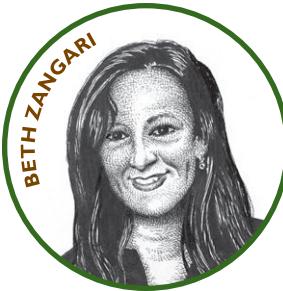
Mouthfeel: Medium-full body; unusual. High carbonation. Warming alcohol. The body is a bit creamy. Not astringent. (3/5)

Overall Impression: Great yeast character but the balance and enjoyment are affected by the big body and maltiness. The alcohol level is fairly big too. Great spicy and fruity flavors, dryness, and bitterness. A smaller and lighter-bodied version would be much more drinkable. The cloudiness detracts as well. (7/10)

Total Score: (37/50)



THE JUDGES' SCORES FOR TANK 7 FARMHOUSE ALE



Aroma: Piney and grapefruit hop aroma up front, followed by lingering fruity fermentation esters. Peppery phenols follow with moderate ethanol aroma. Light Pils malt aroma takes a back seat to hops, esters, and phenols. No DMS. No diacetyl. (8/12)

Appearance: Golden yellow color with some haze. Big, dense, white, long-lasting head. (3/3)

Flavor: Fruity fermentation esters initially and throughout with moderately high spicy and grapefruit hop flavor. Sweet Pilsner malt with a light bready character. Moderate hop bitterness. Light peppery phenols without clove-like notes in the background. Noticeable but pleasant ethanol. No DMS. No diacetyl. (15/20)

Mouthfeel: High carbonation. Creamy, smooth mouthfeel. Lingering bitterness and a touch of astringency. Medium body. Moderate alcohol warming. A bit full and not as dry as the best examples of the style. (4/5)

Overall Impression: A very drinkable beer that seems like the marriage between a light American pale ale (hopping, esters, and maltiness) and traditional farmhouse ale (peppery phenols). Reminiscent of a young bière de garde but works within the broadened saison style guidelines. I'd like to cook some mussels in this beer then have a pint while enjoying them. (8/10)

Total Score: (38/50)

Aroma: Herbal, spicy with clove and a hint of sweet graham cracker malt. A hint of earthy Brett behind ripe plums and apricot. (8/12)

Appearance: Brilliant gold with thick, mousse-like, persistent white foam that laces the glass beautifully with each sip. (3/3)

Flavor: Sweet graham cracker and bready malt supports pronounced earthy, herbal spiciness, herbal hop flavor, and a light note of Brett. Rich, ripe plum, apricot, and hints of pineapple follow. Clove phenols accent a moderate hop bitterness mid-palate to the finish, where it lingers. Well balanced between malt, estery yeast character, hop flavor, then bitterness, as each dances forward and back. (18/20)

Mouthfeel: Medium-light bodied, effervescent, and creamy, with moderate alcohol warming in the lingering finish. (5/5)

Overall Impression: Rich, yet light; sweet and spicy, fruity and complex. Each sip is a new discovery as one component overtakes another, then gives way to something else. Works well with brie and tree-ripened peaches. (8/10)

Total Score: (42/50)

Aroma: Initial notes of lemons and grapefruit, with moderate black pepper and clove phenols. Light grainy and bready notes from Pilsner malt. Carbonic acid adds a slight pungency that accents the peppery notes. Low to moderate floral and fruity esters, including peaches and apricots. (9/12)

Appearance: Straw color with a frothy white, persistent head. Excellent clarity and an enticing sheen. (3/3)

Flavor: Smooth malt is somewhat sweet with light toasted notes. Yeast character provides lemon-pepper notes to balance the sweetness. A light acidity in the finish. Slight, lingering bitterness has more of a peppery phenol character than hop alpha acids. Tropical fruit esters include mango and passion fruit. The finish starts dry, with a light caramel character. (16/20)

Mouthfeel: Fullness from both the high carbonation and dextrins. Slight chalkiness; low to moderate alcoholic warmth. Very light astringency. (4/5)

Overall Impression: Very quaffable interpretation of the saison style. The yeast's pleasant lemon-pepper character provides some spiciness and acidity balanced by malt sweetness. A little less caramel malt or a higher percentage of adjunct sugar would make the finish a little more crisp and refreshing. (8/10)

Total Score: (40/50)

Aroma: Bright lemon and pepper aroma. Strong aromatics, but there is a "pop" to them. Light alcohol spiciness. Very clean, grainy malt base; spiciness dominates. Some fresh hoppy notes present. Quite interesting. Very fresh. (10/12)

Appearance: Huge off-white head, rocky, persistent. Pale gold color. Beautifully crystal clear. Effervescent. (3/3)

Flavor: High bitterness with a clean malt base, lightly grainy-sweet but finishes dry. Spicy-peppery yeast flavor with subtle pear and lemon fruit flavors. Clean, dry finish. Spicy and lightly malty aftertaste. An impression of malt sweetness, but it's not actually sweet. Bitter, spicy, fruity flavors dominate with balancing, supporting malt. (18/20)

Mouthfeel: Medium to medium-light body. Warming but subtle alcohol, seems less than its stated level. High carbonation. Not creamy or astringent. (4/5)

Overall Impression: Great big saison. Malt supports and enhances without getting in the way of the yeast character. Hides its bigness well. Clean malt flavor has richness without interfering with the other flavors. Spicy, lemony, hoppy flavors and bitterness embody the style. One of the freshest and best-looking samples I've had in a while. A brightness to the flavors and aroma make this one special. A super saison indeed. (9/10)

Total Score: (44/50)



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by Charlie Papazian



A Legacy of Sharing

MILLIONS OF YOU OVER THE YEARS HAVE SHARED CONVERSATIONS WITH OTHERS ABOUT YOUR EXPERIENCES WITH WORT, MALT, HOPS, YEAST, WATER, FERMENTATION, BOTTLING, KEGGING, MILLING, MASHING, BOILING, SIPHONING, DRINKING, TASTING, AND ENJOYING.

My first World of Worts column appeared in Vol. 1, No. 1 of *Zymurgy* in December 1978. The name in part was a play on a popular television program at the time, ABC's *Wide World of Sports*. In those days, my friends wondered how I would find things to write about. It was a legitimate concern—at the time, there wasn't much to write about in beer and brewing.

Writing World of Worts has from the beginning been an inventive exercise, but it's what keeps me going. Inventiveness is also the main ingredient that keeps homebrewers passionate about what they do. There will always be new ideas to tinker into reality and good beer.

Through the years, I can attribute my continuing education and inspiration not only to homebrewing pioneers such as Fred Eckhardt and Byron Burch (whom I wrote about in the November/December 2015 issue) but also thousands of other homebrewers worldwide.



Charlie makes a grand entrance at the National Homebrewers Conference in Denver in 1985.

The very cool thing about our homebrewing endeavors is that we've cultivated a culture of sharing. That has made all the difference in the world of beer today. Byron, Fred, and I, along with many others, have written countless books about beer and homebrewing, and we've managed to help spread the word in a high-profile way. But where the yeast hits the wort is on a

personal and local level. Millions of you over the years have shared conversations with others about your experiences with wort, malt, hops, yeast, water, fermentation, bottling, kegging, milling, mashing, boiling, siphoning, drinking, tasting, and enjoying. This level of passing on knowledge, I've come to recognize, is the true essence of homebrew education.

Shout Out Legacy India Pale Lager

ALL GRAIN RECIPE

INGREDIENTS

for 5.5 U.S. gallons (21 L)

9.0 lb	(4.08 kg) English Maris Otter pale malt
1.0 lb	(0.45 kg) 15° L crystal malt
8.0 oz	(227 g) aromatic malt
4.0 oz	(113 g) English brown malt
4.0 oz	(113 g) double roasted crystal malt (120° L)
0.5 oz	(14 g) Vanguard hops, 6% a.a. (3 HBU/84 MBU) 60 min
1.0 oz	(28 g) Cascade hops, 5% a.a. (5 HBU/140 MBU) 10 min
0.25 oz	(7 g) Simcoe hops, 14% a.a. (3.5 HBU/98 MBU) 5 min
0.25 oz	(7 g) Columbus hops, 19% a.a. (5 HBU/140 MBU) 5 min
2.0 oz	(57 g) Cascade hops, 5% a.a. (8.8 HBU/106 MBU) 0 min
0.5 oz	(14 g) New Zealand Nelson Sauvin hop pellets, dry hop
0.25 oz	(7 g) Australian Galaxy hop pellets, dry hop
0.25 tsp	(1 g) powdered Irish moss
I use White Labs Cry Havoc yeast; other lager yeast of your choice will work.	
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity: 1.064 (15.75 B)

Target Extraction Efficiency: 90%

Approximate Final Gravity: 1.016 (4 B)

IBU: about 32 by calculation, not perception

Approximate Color: 14 SRM (28 EBC)

Alcohol: 6.4% by volume

DIRECTIONS

A step infusion mash is employed to mash the grains. Add 11.5 quarts (10.9 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 5.75 quarts (5.5 L) of boiling water and 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 4 gallons (15.1 L) of 170° F (77° C) water. Collect about 6 gallons (23 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 10-minute hops and the Irish moss. When five minutes remain, add the five-minute hops. After a total wort boil of 60 minutes, turn off the heat, add the zero-minute hops, 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 35–45° F (1.5–7° C) for three to six weeks. Prime with sugar and bottle or keg when complete.

I have been working on a multi-year project to digitize the archival photos, videos, audio, and publications of the American Homebrewers Association and Brewers Association. I am sifting through almost 38 years' worth of photos, most of which have never been viewed by anyone but the photographer. As I view and organize the 25,000+ images of American Homebrewers Association National Homebrewers Conferences, competitions, regional conferences, AHA road trips, staff shenanigans, club meetings, shop visits, the Great American Beer Festival, Microbrewers Conferences,

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CULTURE OF SHARING.**

and Craft Brewers Conferences, my view of homebrewing history has taken on an entirely new perspective. The legacy of thousands of homebrewers and their contributions to the success of not only the American Homebrewers Association but of American homebrewing is mind-blowing. So many people, so much fun, so much enthusiasm, so much sharing, so much information, so much involvement, and an evolution of skills, growth, and maturity. All along the way there has been a constant influx of new homebrewers fueling the continuity and the quest for better beer. I am awed. Wow.

Shout Out Legacy India Pale Lager

MASH/EXTRACT RECIPE

INGREDIENTS

for 5.5 U.S. gallons (21 L)

7.0 lb	(3.2 kg) very light malt extract syrup or 6 lb (2.7 kg) very light dried malt extract
1.0 lb	(0.45 kg) 15° L crystal malt
8.0 oz	(227 g) aromatic malt
4.0 oz	(113 g) English brown malt
4.0 oz	(113 g) double roasted crystal malt (120° L)
0.9 oz	(26 g) Vanguard hops, 6% a.a. (3 HBU/84 MBU) 60 min
1.0 oz	(28 g) Cascade hops, 5% a.a. (5 HBU/140 MBU) 10 min
0.25 oz	(7 g) Simcoe hops, 14% a.a. (3.5 HBU/98 MBU) 5 min
0.25 oz	(7 g) Columbus hops, 19% a.a. (5 HBU/140 MBU) 5 min
2.0 oz	(57 g) Cascade hops, 5% a.a. (8.8 HBU/106 MBU) 0 min
0.5 oz	(14 g) New Zealand Nelson Sauvin hop pellets, dry hop
0.25 oz	(7 g) Australia Galaxy hop pellets, dry hop
0.25 tsp	(1 g) powdered Irish moss
I use White Labs Cry Havoc yeast; other lager yeast of your choice will work.	
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity: 1.064 (15.75 B)

Approximate Final Gravity: 1.016 (4 B)

IBU: about 32 by calculation, not perception

Approximate Color: 14 SRM (28 EBC)

Alcohol: 6.4% by volume

DIRECTIONS

Heat 2 quarts (2 L) water to 172° F (77.5° C) and add crushed grains to the water. 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 the 10-minute hops and the Irish moss. When five minutes remain, add the five-minute hops. After a total wort boil of 60 minutes, turn off the heat, add the zero minute hops, and place the pot (with cover on) in a running cold-water bath for 15 to 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 35–45° F (1.5–7° C) for three to six weeks. Prime with sugar and bottle or keg when complete.

Eventually, this collection of photographs will be accessible to the AHA membership, but for now there is still more to do. One thing I will do now is relax, not worry, and have a homebrew. Yes, right now.

In the meantime, there's a new recipe in my fermenter. I have high hopes for Shout Out Legacy India Pale Lager. I'm using a combination of malt-accented pale and specialty malts with the additional twist of brown malt for complexity. My hop accents are dominated by some of my favorites. I find Vanguard hops for bittering to be a smooth con-

tribution. There isn't much going on with the addition of long-boiling time hops in this recipe; that's not a misprint. Generous amounts of homegrown Cascade hops dominate the late hopping. These are pure strains of Cascade hops, not the sometimes-mixed harvests combined with other stray hops in the field. My plants come from stock that I acquired in 1979. A gentle touch of Simcoe and Columbus gives it an earthy foundation. Dry hopping with Nelson Sauvin and Galaxy adds passion fruit and mango character to the authentic foundation of Cascade.

It's a lager! It doesn't need the additional fruitiness of warm temperature ale fermentation; it already has plenty of citrus, mango, and passion fruit. I can't wait. I'm sure it will be a legacy brew. It could be yours, too.

Charlie Papazian is founder of the American Homebrewers Association and author of *The Complete Joy of Homebrewing*.



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Beer Belly Fermentation Supply store located in Sonoma County, where great beer is always brewing. The bigger the belly, the better the brew.

Colorado**The Brew Hut**

15120 E Hampden Ave
Aurora, CO 80014-3906
(303) 680-8898
brewmaster@thebrewhut.com
thebrewhut.com
Colorado's largest homebrew shop is expanding! The Brew Hut will soon offer educational classes and a larger supply of beer, wine, mead, cheese, and soda supplies.

Boulder Fermentation Supply

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Boulder, CO 80301-2301
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fermentationsupply@gmail.com
boulderfermentationsupply.com
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McGuckin.com
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(303) 789-3676
beer@beerathome.com
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Fort Collins, CO 80524-2833
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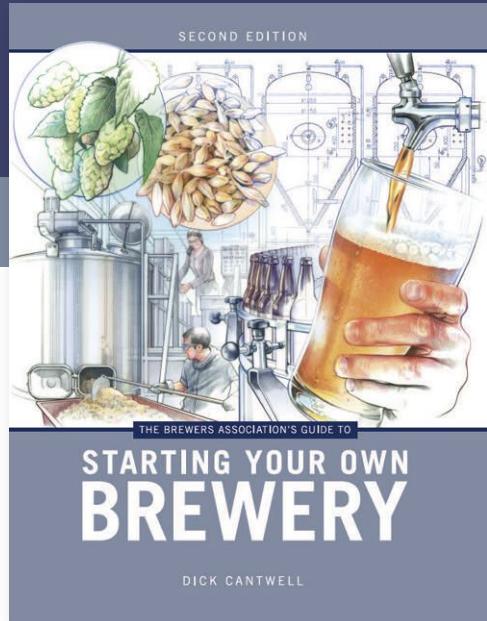


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Life without Temperature Control



After seeing my article “Preparing for the Hopocalypse” in the March/April 2015 issue, my mind was eased and my nerves were calmed. *For about five minutes.* I just don’t feel right without something to worry about.

Then it hit me: *What if my lagering chamber went belly up?* What would I do if I couldn’t brew my regular batches of Pilsner? Or my yearly batch of Märzen? Or an occasional bock or schwarzbiere?

After recovering from my panic attack, I came up with a plan. I brewed a batch of Pilsner and split it three ways:

- #1: Fermented with WLP830 (German Lager yeast) at 54° F (12° C)
- #2: Fermented with WLP830 at 72° F (22° C)
- #3: Fermented with Wyeast 1764 (Pacman Ale yeast) at 72° F (22° C)

For the recipe, I used five pounds of Briess Pilsner DME, eight ounces of sugar,

Sterling hops to bitter, and Saaz to finish. The OG was 1.050 and IBUs were 38.

I pitched the yeasts at noon on May 16. Sample #3 showed the first signs of fermentation with a definite layer of kräusen and a burp out of the airlock by 10 p.m. Sample #2 had some kräusen by 10 p.m., and #1 in the lagering chamber showed just a wisp.

I took a gravity reading on May 18 and #1 was at 1.008 and had a dry, clean, crisp, hoppy finish. Unsurprisingly, it was the most Pilsner-like. Sample #2 was also 1.008 and had a dry, crisp, less hoppy finish with a pleasant amount of fruitiness. Sample #3 ended at 1.006 with a dry, slightly fuller mouthfeel and seemed the least hoppy of the three.

I bottled on May 27. Sample #1 had a nice clear golden color; it was dry with a malt balance, medium bitterness, and a pleasant hop flavor. Sample #2 was a similar color, but somewhat opaque. It also

WHAT WOULD I DO IF I COULDN'T BREW MY REGULAR BATCHES OF PILSNER? OR MY YEARLY BATCH OF MÄRZEN? OR AN OCCASIONAL BOCK OR SCHWARZBIER?

wasn’t as dry or bitter and had a touch of fruitiness. Sample #3 was also golden and opaque. It was somewhat dry, but still had a nice maltiness and was clean with a muted hop presence.

I did a taste test on June 10. Sample #1 was a good Pilsner, dry with medium bitterness. Its thin head quickly faded. Sample #2 was also fairly dry with a fruity edge more like a blonde ale than a Pilsner. It had a medium head that faded fairly quickly and was the least hoppy. Sample #3 was dry, clean, and more lager-like than #2. It also had the biggest head that laced nicely.

I entered Sample #2 and #3 into the Clark County Fair homebrew competition in Vancouver, Wash. Sample #2 scored a 36 as a blonde ale, with a judge commenting that it was somewhat Kölsch-like. Sample #3 scored a 37 as a German Pilsner with the comment, “A well-rounded, drinkable beer.”

These were not the best scores I’ve ever received, but now I know that if my lagering chest ever does fail, I can brew a decent “lager” with ale yeast.

Steve Ruch lives in Vancouver, Wash. and has been homebrewing for 16 years.

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