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# The Search for Unobtanium

What does it mean to be the best? Is it about awards? How about name recognition? Or novelty? Venerability? Rarity?

Naming something *the* best is difficult enough when objective, quantifiable criteria are available. A car with a top speed of 200 miles per hour (320 km/h) is unquestionably faster than one that maxes at 150 (241). But is it necessarily better? If you have tachophobia, probably not.

So how can we define best-ness in a field as complex, nuanced, and diverse as beer? After all, judges at the Great American Beer Festival® have no obligation to award a gold medal in a category if they feel that none of the entries merits the distinction.

Well, just because something is difficult doesn't mean we shouldn't try! For the 14th year in a row, *Zymurgy* asked members of the American Homebrewers Association to name the best commercial beers in the country. And 18,000 votes later, your voices have been heard. Your top-50 list includes stouts and sours, pale ales and porters, and—this may come as a surprise—a healthy, hoppy dose of IPA, regular and extra-strength. Some are familiar faces, while others grace our list for the first time.

But our Best Beers in America issue is about much more than rankings. No matter how you define *best*, something on these pages will help you move a little closer to it. We'll employ sensory analysis to evaluate what we see, smell, and taste. We'll recognize when a beer's temperature might cause us to assess it unfairly. We'll discover the magic that happens when wood and beer meet. And we'll reveal the secrets to brewing a devilishly delightful Belgian Golden Strong Ale.

Of course, great beer is ultimately a product of the brewers who passionately pursue their craft in search of the best. So we'll chat with Fal Allen, brewmaster at Anderson Valley Brewing Company, who offers us a glimpse into a pro brewer's early days and the homebrewing spark that ignited a career. And we'll get to know a brewer from Palestine—the Middle East's first modern-day female to hold the title—and witness how striving for the best means jumping sometimes-formidable hurdles.

Near the end of the first century CE, a prolific Roman writer scribbled the following in one of his letters: "Nihil enim aeque gratum est adeptis quam concupiscentibus." Nothing we obtain satisfies as much as our desire to obtain it. The writer was Gaius Plinius Caecilius Secundus. We know him as Pliny the Younger.

As you work your way down our list of the Best Beers in America, remember that some quests for the best are defined by the elusive: legends of the Seven Cities of Gold, visions of Shangri-La, or whispers of white whales. I encourage you to seek out as many of our Best Beers as you can, but don't fret when, inevitably, some aren't available where you live. Instead, walk to your local brewery and try something new—the rarest beer is the one that never travels beyond brewery walls. Sip and savor and enjoy the experience.

After all, you might just be tasting, in that moment, the best beer in America.

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



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*By Jill Redding and Amahl Turczyn*

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*By Dick Cantwell and Peter Bouckaert*



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Making Your Own Simple Sugars for Complex Beers

*By Amahl Turczyn*

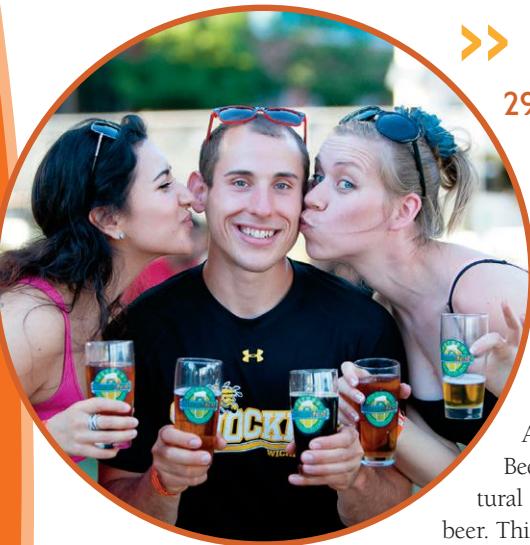
To read this special, members-only online feature,  
go to [HomebrewersAssociation.org/ja16](http://HomebrewersAssociation.org/ja16)

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Find more homebrewing recipes on our website @ [HomebrewersAssociation.org/homebrew-recipes](http://HomebrewersAssociation.org/homebrew-recipes)



## >> GET THERE!

### 29TH ANNUAL OREGON BREWERS FESTIVAL

One of the longest-running craft beer festivals in North America, the Oregon Brewers Festival takes place July 27 through 31 at Tom McCall Waterfront Park in downtown Portland. In addition to a diverse range of beer styles, the festival features five days of live music, food booths, craft vendors, and homebrew demonstrations. The main festival will serve 88 beers from craft breweries across the nation, including two gluten-free products.

A distinguishing feature of the Oregon Brewers Festival is its International Beer Garden, which was incorporated three years ago to promote the cultural exchange of ideas, knowledge, and the worldwide celebration of craft beer. This year's International Beer Garden features six Japanese breweries: Baird Beer, North Island Beer, Tamamura Honten (Shiga Kogen beer), Kumazawa Brewing Co. (Shonan beer), Y. Market Brewing, and the winner of a national Japanese beer competition hosted by the Japan Beer Journalists Association.

Seven Dutch breweries (De Molen, Frontaal, Maximus, Oedipus, Oersoep, Oproer, and Van Moll) and two breweries from Germany (Brauerei Nothhaft and Lang Bräu) round out the international offerings.

For more information, visit [oregonbrewfest.com](http://oregonbrewfest.com).

#### June 25–26

#### Colorado Brewers' Festival

Fort Collins, CO

[downtownfortcollins.com/events/colorado-brewers-festival](http://downtownfortcollins.com/events/colorado-brewers-festival)

#### July 8–10

#### Seattle International Beerfest

Seattle, WA

[seattlebeerfest.com](http://seattlebeerfest.com)

#### July 15–16

#### Vermont Brewers Festival

Burlington, VT

[vtbrewfest.com](http://vtbrewfest.com)

#### July 16

#### Yellowstone Beer Fest

Cody, WY

[yellowstonebeerfest.com](http://yellowstonebeerfest.com)

#### July 16

#### Naperville Ale Fest

Naperville, IL

[napervillealefest.com](http://napervillealefest.com)

#### July 16

#### Rails, Tails & Ales: The Midcoast Craft Beer Festival

Boothbay, ME

[railwayvillage.org/event/rails-tails-ales-the-midcoast-craft-beer-festival](http://railwayvillage.org/event/rails-tails-ales-the-midcoast-craft-beer-festival)

#### July 22–23

#### Denver Summer Brew Fest

Denver, CO

[denverbrewfest.com/summer](http://denverbrewfest.com/summer)

#### July 30

#### 21st Annual Indiana Microbrewers Festival

Indianapolis, IN

[drinkin.beer/event/21st-annual-indiana-microbrewers-festival](http://drinkin.beer/event/21st-annual-indiana-microbrewers-festival)

#### August 5–7

#### 20th International Berliner Bierfestival

Berlin, Germany

[bierfestival-berlin.de](http://bierfestival-berlin.de)

#### August 9–13

#### Great British Beer Festival

Olympia, London, UK

[gbbf.org.uk](http://gbbf.org.uk)



#### August 13

#### Asheville Homebrewers Conference

Asheville, NC

[ashevillebrewers.com](http://ashevillebrewers.com)

#### August 19–20

#### Stone 20th Anniversary Celebration & Invitational Beer Festival

California State University

San Marcos, CA

[anniv.stonebrewing.com](http://anniv.stonebrewing.com)

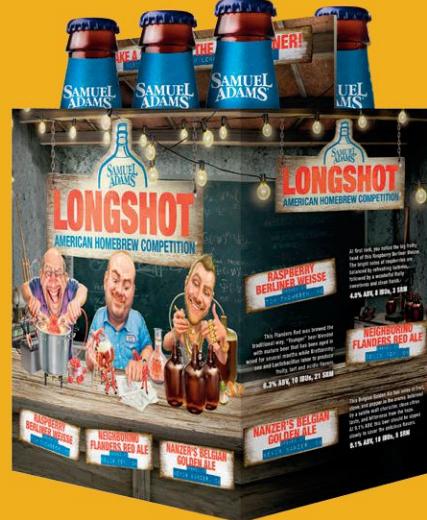
For more craft brewing events, go to [CraftBeer.com](http://CraftBeer.com)

## >> BREW NEWS:

Calling all homebrewers! Samuel Adams is seeking entries for its 20th annual LongShot American Homebrew Contest. The winning recipes from two homebrewers and one Samuel Adams employee will be featured in the next Samuel Adams LongShot variety pack, available nationwide in 2017.

To be considered for the 2016 competition, homebrewers must submit a beer whose style is part of the Beer Judge Certification Program (BJCP) Style Guidelines. The judging panel will consist of notable seasoned brewing experts from across the country and, for the first time, past LongShot winners. Winners will be announced in early October at the 2016 Great American Beer Festival in Denver. Visit [samueladams.com/longshot](http://samueladams.com/longshot) to enter and to find contest rules and regulations. The submission window is July 1 through 22, 2016.

The current Samuel Adams LongShot American Homebrew Contest variety six-pack, which features winning brews from the 2015 contest, was released nationwide in April. The variety pack includes two bottles each of:



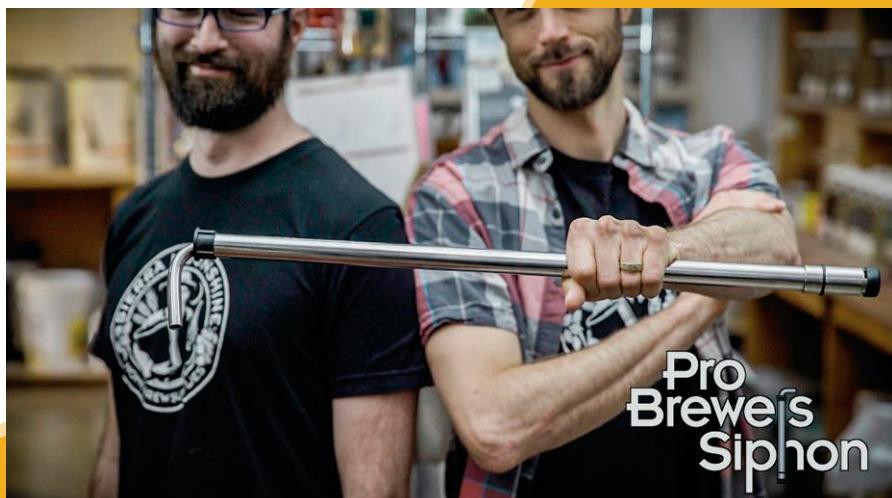
- Tim Thomssen's Raspberry Berliner Weisse (Lincoln, Neb.)
- Kevin Nanzer's Belgian Golden Ale (Mountain View, Calif.)
- Colin Foy's Neighborino Flanders Red Ale (Samuel Adams Employee Winner, Cincinnati, Ohio)

Quantities of these special six-packs are limited, so grab some while you can!

## >> GREAT PRODUCT PRO BREWERS SIPHON

Are you sick and tired of broken racking canes? Wish you didn't have to keep around two siphon starters for your clean beers and your sours? If so, Justin Coyle and Anthony Schoensee, owners of the Sierra Moonshine homebrew shop in Grass Valley, Calif. have you covered. On the heels of a successful Kickstarter campaign, the duo are proud to offer brewers "one tool to rack them all."

Fabricated from two pounds of 304 stainless steel and high-temperature silicone, these siphon-starter racking canes can be completely disassembled and baked in an oven for total sanitation assurance. That clingy Lacto won't stand a chance. And should



Pro  
Brewer's  
Siphon

Photos courtesy of Sierra Moonshine, Boston Beer Co.

dry hops ever clog your wort transfer, just remove the check valve assembly, clean it, sanitize it, and get back to work. As beautiful as it is versatile, this might be the last transfer tool you'll ever need.

For more information, visit [sierrymoonshine.com](http://sierrymoonshine.com).

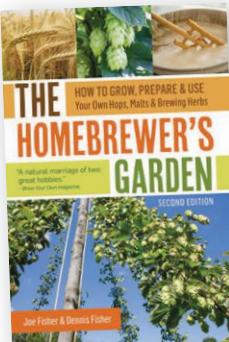
BEER QUOTE

"We're taught from childhood that what is good can't be fun. It's a lie. Homebrewing combines good and fun into one sparkling amber liquid. We can all drink to that."

—Randy Mosher,  
Radical Brewing

## >> BEER BOOKS:

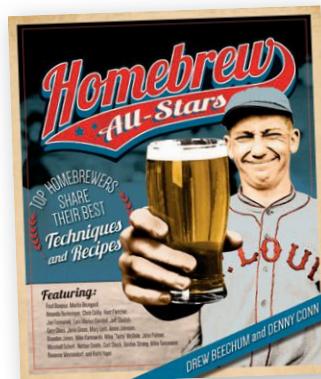
### THE HOMEBREWER'S GARDEN, 2ND EDITION



By Joe and Dennis Fisher

Since 1998, *The Homebrewer's Garden* has been the reference for homebrewers looking to grow their own hops, herbs, and grain. The just-released second edition includes expanded sections on growing hops and trellising, as well as cultivating and malting your own grain. An updated collection of 32 recipes and eight pages of full-color photographs bring *The Homebrewer's Garden* to life with illustrations of trellising techniques and a photo guide to help readers identify popular brewing herbs.

### HOMEBREW ALL-STARS



By Drew Beechum and Denny Conn

From the mad scientists (and AHA Governing Committee members) who brought you *Experimental Homebrewing* comes a brewing book fit for the stars. Join Drew and Denny as they compile the collective wisdom of 25 of today's most talented and prolific homebrewers. From ingredients and equipment to techniques and recipes, you'll learn from the best as they share their secrets. Included in the all-star lineup are AHA Governing Committee members Martin Brungard, Fred Bonjour, and Roxanne Westendorf, as well as AHA director Gary Glass and outgoing AHA project coordinator and National Homebrew Competition director Janis Gross (see *From the Glass*, page 11).

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## >> BEER VACATION: BIKE AND BEER VACATIONS FROM TREK TRAVEL

From the iconic cruiser adorning the Fat Tire label to those bars on wheels that carry a dozen or more riders from one taproom to the next, beer and bikes seem to be made for one another. But for pedal pushers looking for a little adventure, Trek Travel now offers beer-centric cycling trips in Vermont, Oregon, and North Carolina.

Trek Travel's Vermont Brewery Edition trip explores the Champlain Valley and the Green Mountains with stops at Fiddlehead

# Inspiration never tasted so good



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Brewery, Otter Creek Brewing Company, Prohibition Pig, von Trapp Brewery, Rock Art Brewing, and Lost Nation Brewing. Side trips include ascents to Middlebury Gap and Smuggler's Notch, as well as the picturesque Gold Brook covered bridge, rumored to be haunted by a ghost named Emily.

The Bend Mountain Bike adventure features four days of cycling, including a 1,800 foot, 23-mile descent along the McKenzie River Trail, which readers of *Bike Magazine* voted America's number one trail in 2008. Each day begins and ends in Bend, where riders can enjoy the Bend Ale Trail's 14 breweries, including Deschutes, Boneyard Beer, and Crux Fermentation Project. Other activities include floating on the Deschutes River, climbing up to Swede Ridge, and descending to the 97-ft Tumalo Falls at the base of Broken Top Mountain.

North Carolina's Asheville to Highlands trip offers guests a chance to ride the Blue Ridge Parkway, which is only open to cyclists at certain times of the year. Beer lovers can reward themselves at such Asheville breweries as Wicked Weed, Green Man, and Wedge, while excursions to the East Coast outposts of Sierra Nevada and Oskar Blues offer incentive to pedal the extra mile. Other highlights include bluegrass in Highlands and a favorite locals' ride up "The Gorge," which features a ride behind the 120-foot Bridal Veil Falls.

Each trip includes the use of a Trek Domane™ 5.9 bicycle featuring Garmin Touring Plus GPS devices and Di2 electronic shifting, with the option to upgrade to the Emonda SLR, the lightest production road bike available. The Bend trip includes the use of a Trek Remedy 9 or Lush Sl 29er.

For more information, visit [trektravel.com](http://trektravel.com).



## >> YOU'VE GOTTA DRINK THIS REVOLUTION BREWING A LITTLE CRAZY

I wanted to let you know about A Little Crazy, a Belgian pale ale from Chicago's Revolution Brewing Company. It's brewed with Cascade and Citra hops and fermented with a Belgian wit yeast. At 6.7 percent ABV and 35 IBUs, A Little Crazy is higher in alcohol and bitterness than the BJCP guidelines for Belgian Pale Ale suggest, but that doesn't stop it from being delicious! I'm a brewer who thoroughly appreciates both Belgian and American offerings, and this hybrid is my favorite beer on the market right now. *Editor's Note:* A Little Crazy won bronze at the 2012 Great American Beer Festival in the American-Belgo-Style Ale category.

Reviewed by **Toby Johnson**  
**Chicago**



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

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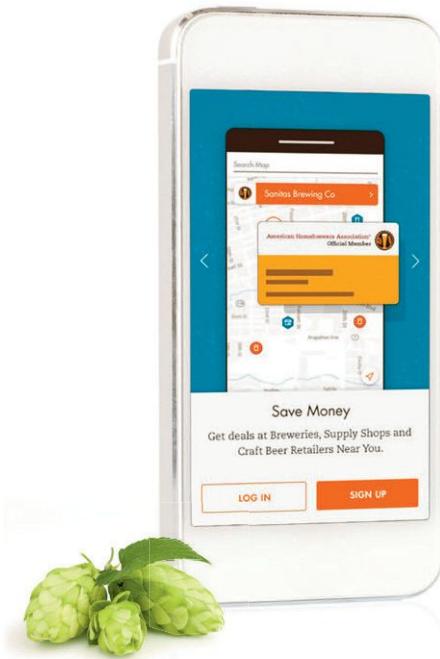


SAMUEL ADAMS  
THIRD VOYAGE

## THINK YOU KNOW HOPS?

Packed with six unique IPAs, Samuel Adams Hopology is an unbridled hop experiment. Featuring hops from three different continents with flavors spanning from citrusy to herbal to unapologetically resinous, each of these beers twists perceptions of what an IPA can be.

By Gary Glass



In the near future, the AHA will launch an exciting new app for Apple and Android devices called Brew Guru. This free app will greatly simplify access to member benefits for current members and offer a taste of what membership is all about to those who have yet to join.

The app features a map not just of AHA Member Deals participants, but also of all the breweries in the Brewers Association's extensive database. Members will be able to set geo-located push notifications to let them know when they are near an AHA Member Deals participant. The app will feature a digital membership card and discount details for each Member Deals location, which will make it easy to take advantage of your member benefits when you walk through the door of a participating business.

The app grants users access to an ever-growing library of curated collections of AHA content on a wide range of homebrew-related topics. If, for example, you are interested in hops for session IPA, the app helps you find relevant Zymurgy features, web articles, recipes, and even growing tips, right on your smart phone or tablet—instant access to the information you want.

## Brew Guru AHA App

You'll even be able to renew your membership right from the app.

For those who have never been members, the app will offer a free trial membership so they can experience the awesome benefits the AHA has to offer before committing to paying dues. It'll be a great way to introduce your friends and fellow club members to the AHA without commitment.

Look for Brew Guru to appear in the Apple and Google app stores in August. We'll be sure to alert all members when the apps are available for download.



### Zymurgy Live

We love coming up with new ways to help members get more out of their AHA memberships. This past May, the AHA introduced our latest member benefit: Zymurgy Live, a series of webinars for homebrewers. For the premiere Zymurgy Live, we featured "Brewing Local with Stan Hieronymus," which gives a glimpse of Stan's latest title from Brewers Publications, *Brewing Local*, set to hit stores this fall.

Participation in the live webinars is limited to the first 1,000 people to RSVP, with AHA members getting preference for joining the presentations. AHA members have exclusive access to the recording of Stan's presentation, as well as all future Zymurgy Live presentations, on

HomebrewersAssociation.org. So if you didn't catch Stan live, you can still check it out at your leisure.



### AHA GC Election

Thank you to all of the AHA members who took the time to vote in this year's Governing Committee (GC) election. The Governing Committee plays a pivotal role in determining the future of your association.

In the 2016 election, the membership reelected Fred Bonjour and returned Denny Conn to the Governing Committee after a required one-year hiatus from the GC. Congratulations to Fred and Denny: I look forward to continuing to work with both of them.

I'd also like to thank Betty Dehoney and George Stewart for demonstrating their dedication to the AHA in running for the Governing Committee.

Those interested in running for the 2017 Governing Committee election can submit nominations to the Governing Committee this fall. Look for calls for nominations on HomebrewersAssociation.org and in your email inbox.

### AHA Staff Transition

At the end of June, AHA project coordinator and National Homebrew Competition (NHC) director Janis Gross will retire after ten-and-a-half years of service to the AHA membership. Janis was the first person I hired upon becoming director of the AHA back in January 2006. Since that time, Janis has become a fixture within the AHA—highly respected by the members who



AHA project coordinator and National Homebrew Competition (NHC) director Janis Gross.

have had the privilege to get to know her, and by her colleagues, who have had the honor to work with her over the past decade. Janis endeared the organization with her dedication to the membership and with her extraordinary level of integrity.

In her tenure as NHC director, Janis oversaw a doubling of the number of entries in the competition from just over 4,000 to around 8,000 in the last few years of the competition. All the while, she remained focused on ensuring a great experience for entrants and volunteers alike.

We will miss Janis' presence at AHA World Headquarters, but know that she will continue to be involved with the AHA in various capacities, particularly with the Great American Beer Festival Pro-Am Competition.

Shortly after Janis announced her intention to retire upon the conclusion of the 2016 National Homebrew Competition back in January, we promoted AHA administrative assistant John Moorhead to project coordinator and NHC director so he could train for a seamless transition and assume the NHC director crown upon Janis' retirement. In April, we hired Millie Shamburger, a homebrewer from Alabama who had recently moved to Colorado, to take over the administrative assistant position.

Janis, you are truly a class act—we will miss you. Cheers to your retirement, you've earned it!



## Big Brew Results

This year's Big Brew was another huge success. In its 19th year, Big Brew, the AHA's celebration of National Homebrew Day, set a new record for participation with 12,780 homebrewers at 483 sites brewing 17,804 gallons of homebrew. In 2016, there were sites in 48 US states and 12 countries around the globe.

Recognizing just how popular this event has become worldwide, the AHA published a Spanish-language version of the event website and the Big Brew recipes. In an effort to welcome the ever-expanding community of homebrewers, the AHA will continue to expand our Spanish-language content in the future.

## Household Membership Pricing

Did you know that AHA members can add people living in their households to their memberships at a discounted rate? It's true, and it's a great way to ensure all of the adults in your household can take advantage of AHA benefits like AHA Member Deals and exclusive access to AHA Rallies, the NHC, and Homebrew Con. Household members share a single subscription to Zymurgy magazine but otherwise have access to all of the benefits of AHA membership.

Starting August 1, the cost per each household member added to an AHA membership will increase from \$22 to \$30 per year. This change is made to bet-

ter reflect the actual value of household memberships, but I certainly encourage all members to take advantage of the lower pricing for household memberships while it lasts.

None of the other membership prices are changing at this time.



### Mead Day

Mark your calendar for the AHA's next international event: Mead Day, held on Saturday, August 6. Mead is likely the world's original fermented beverage. It's delicious and surprisingly easy to make. If you've never made mead, August 6 is the perfect day to find out what the buzz is all about. Check out the Events section at [HomebrewersAssociation.org](http://HomebrewersAssociation.org) for more details.

### Legislative Update

The AHA is working with the California Homebrewers Association to help promote AB-2172, a bill in the California legislature that, if passed, would allow homebrew to be brought onto the premises of businesses licensed by the California Department of Alcoholic Beverage Control (such as breweries and restaurants) for homebrew club meetings and competitions. As of May 25, the bill has been passed by the State Assembly and awaits a hearing before the Senate Governmental Organization Committee, scheduled for June 28. The AHA will send action alerts to its California members as needed to contact state legislators and help ensure passage of this important bill.



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### Homebrew Con

2017

As this issue hits mailboxes and digital devices, it's been barely a week since the 2016 Homebrew Con wrapped up in Baltimore. We'll have

more extensive coverage of that in the September/October issue of Zymurgy, but I want to make sure you get the 2017

Homebrew Con on your calendar. Next year, we'll be in downtown Minneapolis, June 15–17. Though we're still basking in the glow of a successful conference in Baltimore, we are already looking forward to being in the Twin Cities next year. Hope to see you there!

Until next time, happy brewing!

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



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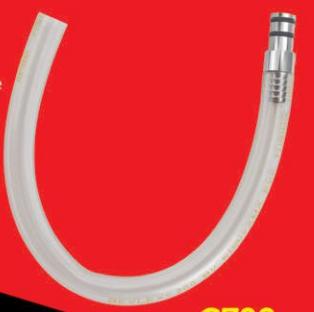


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By Our Readers

# How 'Bout Them Apple Acids?

Dear *Zymurgy*,

Just a quick comment regarding Amahl Turczyn's recent article ("Quick & Easy Malted Cider") in the Mar/Apr 2016 issue of *Zymurgy*. Amahl states that adding cream of tartar will raise acidity, but cream of tartar is not tartaric acid: it's potassium bitartrate. Cream of tartar will not raise acidity and by itself is a tasteless, neutral compound. It's a byproduct of the wine industry, a precipitated substance formed from the tartaric acid found naturally in grapes and potassium found in grape juice. As grape must ferments, potassium bitartrate becomes less soluble and crystallizes out as "wine diamonds." To increase acidity in cider, one may use actual tartaric acid or, better yet, malic acid, which is the main fruit acid in apples.

Thanks. I hope this will be of some benefit to your readers.

Ed Walkowski, MD  
NHC Cidermaker of the Year 2011 & 2014  
Dalton, Pa.

**Zymurgy associate editor and article author Amahl Turczyn responds:** Hi Ed, thanks for clarifying the chemical distinction between cream of tartar and tartaric acid. As you point out, they are not the same—potassium bitartrate is a neutralized form of tartaric acid. However, a saturated solution of potassium bitartrate has a pH of 3.557 at 25° C (77° F), and the National Institute of Standards and Technology actually uses it as a primary reference standard for a pH buffer. Therefore I believe it can be said to contribute acidity. Anecdotally, if you taste a pinch of the stuff, it does leave a tart aftertaste.

*Is it the best acid to use for adjusting acidity in cider? Probably not. Tartaric or malic acid would be far more effective for that purpose, as you mention. However, I have found that*



Above and right: Elivelton Bonato's Northern Brewer hops grown in Joinville, Santa Catarina, Brazil.



*those acids are usually more expensive and more difficult to find. I suggest cream of tartar mostly because any supermarket carries it in the baking and spice aisle, it's safe to use, and it's cheap.*

## News from the Home Front

Dear *Zymurgy*,

This is my daughter and brewing assistant, Maria Fernanda. We are from Brazil, the city of Joinville in the state of Santa Catarina. Our city has a long brewing tradition.

On this day we were brewing a blonde ale. She always helps me on brew day and is getting better. She is only three years old and already knows to identify the smell of hops. I've included photos of my home-grown Northern Brewer hops, which are doing well despite receiving little sun in my city.

Thank you for the great work that *Zymurgy* does to disseminate homebrew culture.

Elivelton Bonato  
Joinville, Santa Catarina, Brazil

Dear *Zymurgy*,

In response to the letter about feeding chickens in the last issue (*Dear Zymurgy*, Mar/Apr 2016), please use something to



Maria Fernanda, daughter and brewing assistant of Brazilian homebrewer Elivelton Bonato.

keep spent grain up off of the ground, especially in pens that limit movement and concentrate the presence of feces and other unsanitary things that could harm your hens. A shovel, trough, or modified bucket would work great. Sharing spent grains with your animals or local farmers is an awesome idea, so brew on and keep your girls healthy and happy!

Josh Mayich  
Darlings Island Farm  
Darlings Island, N.B., Canada



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Greg Jones and his modest home brewery.

Dear Zymurgy,

Years ago I hipped my brothers Chris Jones and Greg Jones to the glories of homebrewing. They've been enthusiastic at-home zymurgists ever since. Greg and his wife Grace recently gave new meaning to "homebrewing" by building an addition to their Missouri home that's dedicated to brewing.

Cheers,  
Marty Jones  
Denver, Colo.



Dear Zymurgy,  
I'd like to introduce you to our brew kitty Baroness Naked (Niki). She is a nine-year-old sphynx rescue and our assistant brewer. Niki starts getting excited when she sees the stir plate and Erlenmeyer flask come out. She is not permitted to be on the counters, so on brew day we have to set up a bar stool so she can be near the action. If not, she meows and fusses until we do. On her supervisory perch, she watches over the process to ensure product quality. Here, she is making sure that Mr. Keith keeps a close eye on the mash temperature.

Cheers,  
Keith Eisel  
Raleigh, N.C.



### Sixteen Paws and a Mash Tun

Dear Zymurgy,  
Thanks to the articles and recipes in the magazine and the community on the website, my beers keep getting better, and I love the member discount at my local homebrew store. I've recently taken the leap to lagers and decoction mashing! Here is my Brewing Beagle Brigade helping me get ready to dough-in a big doppelbock on my birthday.

Cheers, and keep up the good work!

Matt Koval  
Forest Lake, Minn.

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

**Hey homebrewers! If you have a homebrew label that you'd like to submit for the Dear Zymurgy section, send it to magazine art director Jason Smith at [jason@brewersassociation.org](mailto:jason@brewersassociation.org).**



## READER-SUBMITTED HOMEBREW LABELS

I wanted to share a label I created of my late brew dog, McAllister "Ally" Greene. She was a West Highland White Terrier, more commonly called a Westie. She lived a full and long life, making it to 15.5 years.

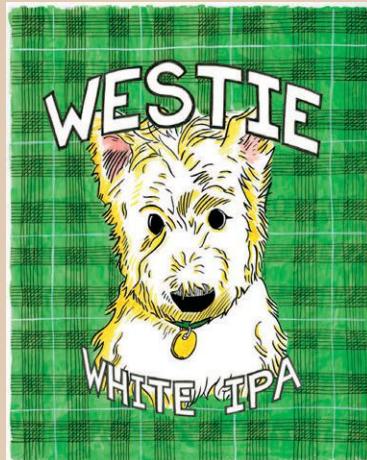
I wanted to create a memorial to Ally, who was my best friend for so long. What better way than to name a beer I love after her? Just so happens they both had "white" in them, so I worked on the Westie White IPA, known simply as Westie to my wife and buddies.

I had my friend Steve Zittel, who is a daytime coffee roaster and nighttime comic book artist, create this label for me. Everything is hand drawn, including the plaid. I think he did a wonderful job, and I would love to share his hard work with everyone. I entered this label into the Homebrew Label Awards contest last year and earned an honorable mention.

Here are labels for two beers I brewed for my wedding last year in May. My best man and I made back to back (to back!) batches of beer to yield 150 pints for the guests. We had a blast making them, and they were the first to go!

I've enjoyed brewing for five years on my own, with my wife, with my dog, and with my friends. I brew all-grain using the brew-in-a-bag method, and my favorite style to make is saison.

I'd love to celebrate my one year wedding anniversary with a mention in *Zymurgy*!



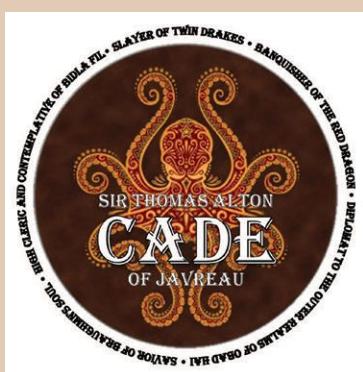
My Westie White IPA has a permanent spot in my kegerator with a custom tap handle of course!

Cheers!

**Tom Greene – Sheboygan Sudzzers  
Sheboygan, Wis.**



**Michael Hess – Buffalo Grove, Ill.**



Sir Thomas Alton Cade (of Javreau) is brewed in honor of my best friend Matt's Dungeons & Dragons character. One night he slipped a small note into my wallet—*Make a chocolate raspberry stout. Name it Cade*.—and the rest is history! We still keep the note on our brewing corkboard to remind us why we brew. Comprised of Maris Otter, flaked oats, cocoa powder, and raspberry puree, this beer has been reformulated many times, each time getting a little closer to what Cade would call perfect.

The stylized octopus is a nod to his deity Bidla Fil, which he created himself. The words encircling the crest are the list of titles that he has accumulated on his journeys, each of which has an awesome story behind it.

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**Toby Johnson – Chicago, Ill.**

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By Professor Surfeit



# Yeast Rehydration

Dear Professor,

I've often read that dry yeast should be rehydrated in the temperature range of 100 to 105° F (37.7 to 40.5° C). However, the specification sheet for Safale yeast suggests rehydrating it in the temperature range of 74 to 86° F (23.3 to 30° C). Do you have any thoughts on the discrepancy?

Thanks!

Dustin Strong  
Miles City, Mont.

Hi Dustin,

*Good sleuthing! That must be a pretty unnerving and confusing set of specifications. It wasn't all that long ago that scientists who were involved with improving dry yeast for brewers recommended rehydrating with 100 to 105° F water. Now those same companies are telling us the optimal range should be 74 to 86° F.*

*This kind of revision is not uncommon in the world of science. In fact, scientific recommendations are simply guesses at the best ways to explain or do things at a given moment in time based on the available data. While the yeast itself probably has not changed, deeper and more sophisticated research has fine-tuned the recommended rehydration procedures.*

*What the information sheet doesn't tell us is what this "optimal" rehydration procedure is based upon. Ease of use? Yeast viability? Quicker fermentations? Reducing effects of rehydration shock (thus promoting healthier yeast)? Or something else altogether?*

*My colleague Charlie Papazian recently attended a lecture by Weihenstephan Professor Thomas Becker. His recent research suggests that rehydrating dry yeast in wort of about 10° Plato (1.040 specific gravity) yields the highest viability of rehydrated*



yeast. His premise emphasized wort rather than temperature. This research is contrary to what scientists were promoting just 15 years ago.

You see, science is a moving target, and scientists' recommendations are always based on a very specific set of circumstances upon which their research is conducted.

All of this said, you can rest assured that you will make excellent beer with rehydration at either set of temperatures. Who knows? Ten years from now they may recommend rehydrating yeast in a weightless environment.

Can't wait,  
The Professor, Hb.D.

## Gifting Beer for the Ages

Dear Professor,

My name is Andy and I'm a homebrewer who has recently gotten into collecting and cellaring beers. I enjoyed reading your article about waxing the tops of bottles, and I plan to start doing this with my own collection. I'm writing to ask for

some suggestions for beers that might be aged for an extended period of time. I've got a handful of friends who are expecting their firstborns, and I was thinking about getting them something that could be saved until they are of drinking age. Nothing too expensive or extremely rare, just something that will be a nice treat for those sharing it. I'll be waxing the tops of these, of course.

Thanks in advance,  
Andy Gauvin  
Rochester, N.Y.

Dear Genius,

*It's good to give. I like it. Decrypting your note, it appears you are looking to help keep beer in good shape for 18 to 21 years (who knows what the drinking age will be in the 2030s?). That's a tall order for most commercially made beers. I'd seek out the higher-alcohol beers, and I'd also look for beers that are unfiltered or have live yeast still in the bottle. That yeast will scavenge any oxygen in the bottle—to an extent.*

*Beers to stay away from include pasteurized beers, beers bottled in screw-top bottles, and beers bottled in any kind of glass other than brown. Other thoughts: I wouldn't be too confident that living, unpasteurized "wild" sour beers would offer a very pleasant tasting experience after 18 to 21 years, though true lambics would be an exception. (I've had decades-old true lambics that have been spectacular). Beers lightly spiced with coriander and/or cinnamon might be a good bet since those spices are very strong antioxidants that may reduce the effects of oxygen.*

*Dark beers may tend to hold up better, but I'd avoid beers that have moderate or heavy caramel flavors. Some caramel malts, especially medium to dark caramel*



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and crystal malts, tend to cause rapid oxidization, creating an unpleasant character. Beers with black malts can mellow out quite nicely, though, just as aggressive red wines tend to, and beers that include smoked malts can also improve with time when properly stored (think smoked doppelbock and smoked porter).

Keep in mind, too, that buying a bottle of beer isn't necessarily a guarantee that detrimental oxidation won't or hasn't already occurred. It's hard to know whether breweries have taken extra measures to minimize oxidation in their beers that could occur after packaging. If a brewery's beers are easily oxidized by day-to-day stress in a few months, that is a tell-tale sign that even their strong beers probably won't hold up for 20 years.

Provide storage instructions with your genius gifts, insisting on cool, dark, dry environments and minimal agitation. Cellars can be quite humid, so recommend a moisture barrier container or bag. Oh, and if it's a corked beer, lay it on its side. Additionally, if you can spring for real sealing wax, go for that over paraffin. Paraffin will crack and may fracture if subjected to temperature fluctuations and mishandling.

These are but a few thoughts that come immediately to my mind. For more on brewing and aging cellar-worthy beers, check out "Crafted Classics: Homebrewing Vintage Beers" by Patrick Dawson in the Mar/Apr 2014 issue of Zymurgy.

Good luck, and thanks for creating future happiness.

Here and now,  
The Professor, Hb.D.

### **Enlightening Mini-Lesson**

Dear Professor,  
I recently read an article about off-flavors on the American Homebrewers Association website, and it made me wonder: what are the most common off-flavors that you regularly encounter in beer? Are there three or so that really stick out?

Cheers,  
Frank Platteau  
Antwerp, Belgium

Hey Frank,

Thanks for thinking about this. As you know, there are hundreds and hundreds of off-flavors that can be singular or combined with others to create an undesirable beer experience. Keep in mind that an off-flavor is one that is not intended in the type of beer you are enjoying: a characteristic that is "off" in one beer style may very well be desirable in another. Here are a few flavors and aromas that I often encounter when they shouldn't be present.

- Diacetyl (butterscotch-like)
- DMS (dimethyl sulfide, which is akin to sweet corn)
- Sourness (lactic acid from Lactobacillus and other bacteria)
- Cider- and apple-like characters (sometimes acetaldehyde or lack of aging)

Other common off-flavors I run across include oxidation, which is commonly described as stale caramel, wet cardboard or paper, or wet garbage can (though some oxidation can actually confer pleasant wine-like or sherry-like characteristics to certain well-aged strong styles). There are also phenolic flavors, which can come off as medicinal or like an adhesive bandage (often due to wild yeast contamination or cleaning issues). Plastic-like flavors may come from plastic equipment, or from chlorophenols, which can crop up if your water contains chlorine. Finally, astringency comes from improperly handling and mashing grain.

These are just a few, but if you are a knowledgeable brewer, you may recognize that these common off-flavors and aromas can turn up at various stages of a beer's lifespan. Issues involving sanitation, equipment, mashing, boiling, fermenting, aging, packaging, storage, and time all factor into "getting it right."

I hope this mini-answer to your mini-question is enlightening.

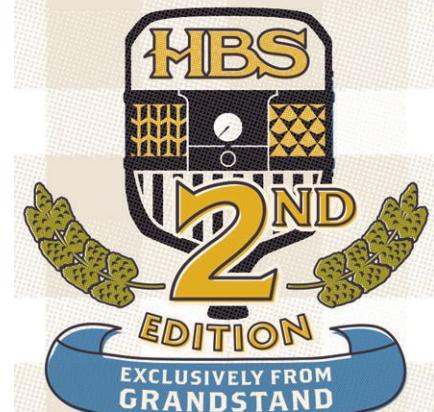
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By Amahl Turczyn

# Belgian Golden Strong Ale

**B**elgian Golden Strong Ale (BGSA) was born of a desire by Belgian brewers to compete with a glut of imported pale lagers around the turn of the century. In many ways, it's a twist on the classic Belgian tripel style, which it resembles in many ways. For our style-focused recipe, it would make sense to target the progenitor of the style, Duvel Moortgat's flagship Duvel.

Fans, myself included, are quite familiar with the beer's reputation for class and sophistication, right down to its traditional corked and crowned 750-mL bottle. Duvel seems to represent the best of European Pilsner and French Champagne. As imitations have cropped up from various other brewers, many of them with further plays on the name "devil," it seems only right to pay our respects as homebrewers and brew our own version—carbonation is, after all, the sincerest form of flattery. As you'll soon see, brewing a Belgian Golden Strong is relatively easy. But brewing one that tastes like Duvel? That gets tricky.

## Stylistic Features

In general, the BGSA style tends to be even paler and drier than tripel, with very high attenuation, despite its often formidable strength, and a correspondingly low finishing gravity. This lightness of palate weight lends it a crisp finish, and while it isn't an overtly hoppy beer (the BJCP pegs its bitterness at just 22 to 35 IBUs), the bone-dry finish allows what hops there are to really come forward.

Helping that dry finish along are two other factors, which also must be correctly dialed in to get the overall balance of the style right. One is alcohol, which is usually 8.5 percent by volume if we use Duvel



as the benchmark. BGSA's in general fall within a range of 7.5 to 10.5 percent. Produced by a very fermentable Pilsner-malt wort and boosted with a generous 15 to 20 percent sugar, alcohol serves to dry the pale beer's finish considerably.

The second factor is carbonation, which is done in classic Belgian style: from re-fermentation in the bottle. The dosage of priming sugar at bottling is enough to produce around four volumes of CO<sub>2</sub>, which means abundant effervescence. It also means you will need sturdy bottles, a cold serving temperature, careful pouring technique, and proper glassware to contain the inevitably voluminous cloud of white foam. This foam, in volume, tenacity, and texture, is virtually a trademark of the style, but it serves the palate as much as it does the eyes—the high

carbonic acid levels accentuate dryness and apparent bitterness.

## Ingredients

Classic, noble-quality hops are essential since you get a big punch from relatively light hop additions. Saaz-type aroma varieties, and Styrian Golding are most commonly used, but Kent Golding is occasionally substituted. It might be tempting to brew a BGSA with late, whirlpool, and dry hops of high oil content, perhaps with some of the wilder tropical fruit character so much in style now, as all that carbonation would make for a very strong olfactory hop delivery. But much of the charm of Duvel and its brethren styles comes from delicacy and balance.

The spicy, peppery notes so familiar to Belgian tripel and saison fans are present,

but they play a more background role to soft, fruity aromatics, most commonly apple and pear. Sweet fruit notes soften the dry, spritzy finish somewhat, even though hop grassiness (Saaz) and marmalade fruitiness (Goldings) are surprisingly forward in light of the amounts called for in the recipe.

After hop selection, yeast is probably the most critical factor. Duvel uses a single yeast strain that is rumored to have been isolated from a bottle of McEwan's Scotch Ale by brewing scientist Jean De Clerck after World War I. In conjunction with

the exhaustive fermentation process, this strain produces pear and apple esters and background hints of pepper and lemon. It is available from at least two yeast suppliers as White Labs WLP570 Belgian Golden Ale Yeast and Wyeast 1388 Belgian Strong Ale.

Since you are asking so much of your yeast for this beer, make sure you have a big stir-plate yeast starter: 1.5 liters (about 265 billion cells) may seem extravagant, but it will give you peace of mind that this behemoth of a beer will actually reach its target finishing gravity. About the worst thing you can do is end up with a sweet, under-

attenuated BGSA, so unless you re-pitch the yeast from a (preferably lower-gravity) previous batch, go with a big starter.

Malt should be of the Pilsner variety, ideally sourced from Belgium. Dingemans Pilsner is my preference, but Castle produces excellent results as well. Don't be tempted to add flaked barley, caramel malts, or dextrin malt—100 percent Pilsner is all that is necessary, though a small percentage of acidulated malt may be needed to achieve the proper mash pH.

Duvel was once darker than it is now, but the brewery reformulated it in the 1970s to its current, very pale 3–4 SRM. They did this by malting barley onsite to their own specifications, at least for a decade or so. Now Duvel's malt is selected from other malting companies, but it is still malted to the same remarkably pale color. Pilsner malts from other countries can also be used, of course, but choose one with the lowest color rating you can.

For the sugar, plain dextrose (corn sugar) is best. It is added at three different points in the process: once in the kettle (8 percent of total fermentables), once in primary (6 percent), and once at bottling (4 percent). One shortcut is to combine the first two additions into a single kettle addition of 14 percent, followed by the priming addition of 4 percent at bottling. This places a greater initial burden on the yeast, however, so it isn't recommended.

Water should be reverse-osmosis filtered with 1 gram of calcium sulfate per gallon of water. Clarifiers like Whirlfloc in the kettle and gelatin during the cold conditioning period are recommended, as the suggested yeast strain tends to want to stay in the beer.

Now that we've covered ingredients, we can dive into the complexities of process, and complex they are—the devil, as they say, is in the details. Duvel Moortgat's mash, fermentation, cold-conditioning, and bottle-conditioning processes are all strictly regulated and are formidable to even the most dedicated homebrewer. Of course, some of these rules can be bent a bit depending upon your home brewery

## The Blue Devils BGSA

### INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

<b>10 lb.</b>	(4.54 kg) Belgian Pilsner malt
<b>1 lb.</b>	(0.45 kg) Dextrose (in boil, 15 min)
<b>12 oz.</b>	(0.79 kg) Dextrose (in primary—see directions)
<b>8 oz.</b>	(227 g) Dextrose for priming
<b>4 oz.</b>	(113 g) Acidulated malt
<b>1.25 oz.</b>	(38 g) Styrian Goldings pellets, 5.4% a.a. (60 min)
<b>1.5 oz.</b>	(42 g) Saaz pellets, 4% a.a. (20 min)
<b>Whirlfloc</b>	(boil, 15 min)
<b>Gelatin finings</b>	(add before cold conditioning)
Belgian Golden Ale yeast	
	(1.5 L stir-plate starter or 3 fresh yeast packs)

### Original Gravity:

1.059 (14.5° P) with kettle addition of sugar  
1.066 (16.25° P) with primary addition of sugar  
1.070 (17° P) with priming sugar

**Final gravity:** 1.006 (1.5° P)

**IBUs:** 30

**SRM:** 3

**ABV:** 8.5%

**Boil Time:** 60 minutes

**Assumed Brewhouse Efficiency:** 75%

### DIRECTIONS

Using reverse osmosis water treated with 1 gram calcium sulfate per gallon (0.26 g/liter), mash grains at 147° F (64° C) for 60 minutes. Raise to 151° F (66° C) and hold another 30 minutes. Mash out at 168° F (76° C) for 10 minutes. Collect wort and boil for 60 minutes, adding 1 lb. dextrose to kettle 15 minutes before knockout. Chill to 64° F (18° C) and oxygenate wort. Pitch active yeast starter. A day after high kräusen is reached (usually 3 to 4 days from pitching) add 12 oz. (340 g) dextrose to just enough water for it to dissolve. Boil the solution 10 minutes, cool briefly, and add it directly to primary. Allow primary temperature to rise from 64° F to 78° F (26° C), applying heat if necessary. When final gravity is reached, usually after about 8 days, add (or rack onto) gelatin fining solution and crash to 32° F (0° C). Hold at this temperature for 21 days. Rack clear beer and blend thoroughly with a solution of 8 oz. (227 g) dextrose and a dose of fresh yeast (an active starter of the Belgian Golden strain, or properly rehydrated Champagne dry yeast). Bottle in sturdy brown bottles. Keep bottles at 75° F (24° C) for two weeks to allow for carbonation. Chill a bottle and verify carbonation has reached around 4 volumes. If this is the case, cold-store remaining bottles for six weeks at 40° F (4° C) to allow beer to smooth out and mellow.

### MALT EXTRACT VERSION

Substitute 7.8 lb. (3.54 kg) Pilsner malt extract syrup for the Pilsner malt. Dissolve malt extract in brewing water and proceed with 60-minute boil as above. Color may be slightly darker than that of all-grain version.

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# Middle Class Malt Liquor

## INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

<b>9 lb.</b>	(4.08 kg) Pilsner malt
<b>2 lb.</b>	(0.9 kg) Flaked maize
<b>4 oz.</b>	(113 g) Acidulated malt
<b>1 lb.</b>	(0.9 kg) Dextrose (boil, 15 min)
<b>1 lb.</b>	(0.45 kg) Dextrose (in primary—see directions)
<b>1 oz.</b>	(28 g) Hallertau Hersbrucker pellets, 4% a.a. (60 min)
<b>1 oz.</b>	(28 g) Hallertau Hersbrucker pellets, 4% a.a. (20 min)
<b>1 oz.</b>	(28 g) Hallertau Hersbrucker pellets, 4% a.a. (10 min)
<b>1 oz.</b>	(28 g) Hallertau Hersbrucker pellets, 4% a.a. (at knockout, steep 10 min)
<b>Whirlfloc</b>	(15 min)

American lager yeast (3 L stir-plate starter)

## Original Gravity:

1.059 (14.5° P) with kettle addition

of sugar

1.066 (16.25° P) with primary addition

of sugar

1.072 (17.5° P) with priming sugar

## Final gravity: 1.004 (1° P)

## IBUs: 24

## SRM: 3.5

## ABV: 9%

**Boil time:** 60 minutes

**Assumed Brewhouse Efficiency:** 75%

## DIRECTIONS

Using reverse osmosis water treated with 1 gram calcium chloride per gallon (0.26 g/liter), mash at 147° F (64° C) for 60 minutes. Raise to 151° F (66° C) and hold for another 30 minutes. Mash out at 168° F (76° C) for 10 minutes. Collect wort and boil for 60 minutes, adding 1 lb. dextrose to kettle 15 minutes before knockout. Chill to 54° F (12° C) and oxygenate wort. Pitch active yeast starter. A day after high kräusen is reached (usually 3 to 4 days from pitching) add 1 lb. dextrose to just enough water for it to dissolve. Boil the solution 10 minutes, cool briefly, and add it directly to primary. Ferment at 53–54° F (12° C) for about three weeks, or until final gravity is reached. Bring to 60° F (16° C) and hold for a 3-day diacetyl rest. Fine with gelatin finings and cold crash to 32° F (0° C) to clarify. Keg and force carbonate clear beer. Then, if desired, counter-pressure bottle in large, tasteful brown bottles at about 3 vol. CO<sub>2</sub>. Lager packaged, carbonated beer at 32° F (0° C) or slightly below for at least 2 months before serving.

## MALT EXTRACT VERSION

Substitute 7.25 lb. (3.29 kg) Pilsner malt extract syrup for the Pilsner malt, flaked maize, and acidulated malt, and increase the 15-minute kettle addition of dextrose to 2 lb. (0.9 kg). Dissolve malt extract in brewing water and proceed with 60-minute boil as above.

(64° C) for 60 minutes, then increase to 151° F (66° C) and hold for 30 minutes. This shortcut still produces highly fermentable wort and shaves off a good portion of time in the brewhouse.

## Fermentation

The BGSA yeast strain tends to take its time, especially towards the end of fermentation, but getting it to finally drop out of solution is a challenge to say the least. There is also the issue of fusel and ester production early on, so Duvel employs a rollercoaster-like temperature sequence, with heating and cooling extremes. To mimic this schedule at home, a heated and cooled fermenter really comes in handy.

You'll want to pitch WLP570 or Wyeast 1388 at 64° F (18° C), ramp it up slowly over the first week to 78° F (26° C), then hold it at that temperature until the beer is fully attenuated. Some sources suggest taking it as high as 84° F (29° C), but I've found that this high a temperature can produce isoamyl acetate (banana esters), and those are definitely not welcome in the style. Pitching at a low temperature and keeping the temperature below 70° F (21° C) prior to high kräusen minimizes fusel production, and you'll notice that for all its alcohol, Duvel is not a "hot" or fumy beer. It also keeps the yeast from consuming fatty acids too early—these are saved for ester production later, after the temperature increases.

About a day after your beer reaches high kräusen (usually on day four) is the ideal time to add the second dose of sugar (six percent of the grain bill, which is 12 oz. or 340 g in our recipe), as the yeast has multiplied to a sufficient degree to tackle the extra food. Prior to this point, the wort gravity is only 1.059 (14.5° P) after the kettle addition of 1 pound (0.45 kg) of dextrose 15 minutes from the end of the boil, so the yeast can go through its growth phase unhindered by excessive osmotic pressure. The fermenter should be at about 68° F (20° F) when adding the primary addition of dextrose, which should be boiled briefly with just enough water to form a solution. Then fermentation temperature can continue to increase to 78° F (26° C) to allow for controlled ester production, specifically the apple,

setup, but to get a result that's as close as possible to the target beer, you'll need to mimic a lot of Duvel's elaborate process. The good news is I've made this beer the hard way and the not-so-hard way, and even the corner-cutting versions are excellent. The biggest concern is to care for your yeast, because this style places huge demands on it, and a stuck or incomplete fermentation will throw off the balance that's key to the style.

## Mashing

As with many Belgian beers, maximum fermentability comes from a lengthy, slow-ramped mash schedule and the

use of sugar as an adjunct. The mash is perfectly achievable at homebrew scale, but a heated tun is a necessity if you want to do the full four-hour ramp mash. Doughing in with cold water and very gradually increasing the temperature to 168° F (76° C) over this lengthy period allows the mash to hit every enzymatic optimum temperature along the way. As a result, everything that can be broken down into fermentable sugar will. Getting the same results exclusively from hot water additions would be nearly impossible, but great results can still be achieved with an infusion-friendly schedule: mash in and hold at 147° F



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pear, and lemon notes that define the style. The tenacious yeast should have enough energy to attenuate the beer to 1.006 or even lower.

### Cold Conditioning and Bottling

After this, the beer is racked into secondary, blended with gelatin finings, crashed to 32° F (0° C) and held at just under freezing temperatures to cold condition for three weeks. It is then fully attenuated and ready for priming and bottle conditioning. That means dosing it with fresh

yeast, blending with more sugar (the final four percent of total fermentables), bottling, and then warming the bottled beer back up to 75° F (24° C) to re-ferment for another two weeks. Finally, after it clarifies, it can be chilled back down to about 40° F (4° C) and stored for six weeks to mellow and allow flavors to mingle.

One can even forgo the final priming and dosage with fresh yeast, but there are a few caveats to this particular shortcut. First, you needed to have added the bottling

sugar along with the primary addition on the fourth day of fermentation, for a total of 20 oz. (567 g). Second, you need to monitor attenuation closely and cold crash the beer when it reaches the proper gravity in order to stall attenuation. If you are confident in your mash procedure, you can be fairly certain the beer will eventually reach 1.006 in the bottle, so bottling at 1.012 will allow residual sugars to carbonate the beer to the desired 4 volumes of CO<sub>2</sub>.

(Anecdotally, I prefer to leave myself a little wiggle room here and bottle a bit later, at closer to 1.010. I've had this strain attenuate to even lower than 1.006 in the past, and I'd rather risk slightly less fierce carbonation than exploding bottles.)

Third, you need to understand that your yeast is tired by now. This Belgian strain can do the job, but it may take several weeks even after the warm, in-bottle conditioning for carbonation to reach its eventual peak, the beer to clarify, and the finish to achieve maximum dryness. Fourth and finally, even with cold crashing, these bottles will have more yeast sediment in them than those pre-clarified and re-dosed with fresh yeast. This is pretty much unavoidable if you don't have the luxury of sanitary filtration. So pour carefully!

### Stylistic Class Ranking

We've all heard that porter was a working-class beer, and imperial stout was at one time a beer for nobility. Stylistic class ranking is determined largely by that of the style's targeted demographic. Belgian Golden Strong Ales, and Duvel in particular, are viewed as higher-ups in the social strata, even out-classing the beers Belgian brewers originally intended them to compete with: European pale lagers. The ultra-pale color was (and still is) a bit of a novelty, and the posh, corked bottles added to the image of a beer style head and shoulders above the rest. But from a formulation perspective, what is there that separates BGSAs from good old American malt liquor? As a style, the latter gets no respect—Pilsner malt dosed with white sugar to spike up the alcohol, and served extra fizzy from an oversized brown bottle. Sound familiar?

Sure, malt liquor isn't typically made with fine-quality hops, and it usually

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has a high proportion of corn and/or rice adjunct in addition to the sugar, but wouldn't a BGSA fermented with clean lager yeast taste, well, malt liquorish? In a blatant attempt to meddle with the natural order, I present for your stylistic consideration a spin on BGSA that seeks to elevate humble malt liquor to a beer with a bit more class. Hallertau Hersbrucker provides some much-needed hop sophistication, American Pilsner yeast should allow for a clean ferment, and corn joins dextrose for adjunct duties, but many of the same mashing and fermentation techniques can be borrowed from its uppity Belgian cousin across the pond. Brewed with enough homebrewer ingenuity, this malt liquor might just find a place of honor, proudly displayed in a fancy glass, with no need for a brown paper bag.

## References

1. Hieronymus, Stan. *Brew Like A Monk: Trappist, Abbey and Strong Belgian Ales and How to Brew Them*. Brewers Publications, 2005.

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

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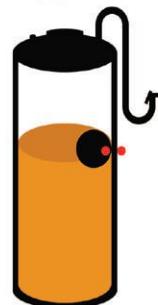
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# The Results Are In!

By Jill Redding  
with recipes by Amahl Turczyn

Welcome to the party, Lawson's Finest Liquids!

We see you, Tree House Brewing.

Way to muscle your way in there, Toppling Goliath.

**W**hile the 14th annual Best Beers in America survey is filled with familiar names (yes, Russian River's Pliny the Elder won for a mind-boggling eighth straight year), some "newcomers" have popped onto the radar and into the glasses of American Homebrewers Association members. With more than 4,400 breweries now operating in the United States and a constant barrage of new beers to choose from, AHA members face a more challenging task in the Best Beers voting each year.

"So many great beers, and so little time to get to sample them all!" lamented AHA member Mathew Trzepacz of Wallingford, Pa.

AHA members were able to choose up to 20 of their favorite commercial beers available for purchase in the United States in an online voting system. More than 18,000 votes poured in for 2016.

**TOP-RANKED BEERS**

(T indicates Tie)

- 1. Russian River Pliny the Elder\***
- 2. Bell's Two Hearted Ale\***
- 3. The Alchemist Heady Topper**
- 4. Ballast Point Sculpin IPA**
- 5. Ballast Point Grapefruit Sculpin**
- 6. Founders Breakfast Stout**
- 7. Three Floyds Zombie Dust**
- 8. Bell's Hopslam**
- 9. Goose Island Bourbon County Brand Stout**
- T10. Deschutes Fresh Squeezed IPA\***
- T10. Stone Enjoy By IPA**
- 12. Founders KBS (Kentucky Breakfast Stout)\***
- 13. Sierra Nevada Pale Ale**
- 14. Lawson's Finest Liquids Sip of Sunshine**
- 15. Dogfish Head 90 Minute IPA\***
- T16. Founders All Day IPA**
- T16. Sierra Nevada Celebration\***
- 18. Cigar City Jai Alai IPA**
- 19. Boulevard Tank 7 Farmhouse Ale**
- 20. Firestone Walker Wookey Jack\***
- 21. Arrogant Bastard Ale**
- 22. Lagunitas Little Sumpin' Sumpin'\***
- 23. Deschutes Black Butte Porter\***
- T24. Left Hand Milk Stout Nitro\***
- T24. Tröegs Nugget Nectar**
- 26. Firestone Walker Union Jack**
- T27. Founders Backwoods Bastard**
- T27. Russian River Blind Pig IPA**
- T29. Lagunitas IPA**
- T29. Odell IPA\***
- T29. Russian River Consecration**
- 32. Sierra Nevada Torpedo Extra IPA**
- 33. Tree House Julius**
- T34. Ballast Point Victory at Sea**
- T34. Dogfish Head 120 Minute IPA**
- T34. Fat Head's Head Hunter IPA**
- T34. Firestone Walker Double Jack**
- 38. North Coast Old Rasputin\***
- T39. Oskar Blues Ten Fidy**
- T39. Russian River Supplication**
- T39. Toppling Goliath pseudoSue**
- T42. Firestone Walker Parabola**
- T42. Surly Todd the Axe Man**
- 44. Great Lakes Edmund Fitzgerald Porter**
- 45. Russian River Pliny the Younger**
- T46. Prairie Artisan Ales Bomb!**
- T46. Surly Furious**
- T46. Victory DirtWolf Double IPA**
- 49. Maine Beer Lunch**
- T50. Dogfish Head 60 Minute IPA**
- T50. New Belgium La Folie**

\* Clone this beer at home! Find the recipe on our website  
[HomebrewersAssociation.org/clones](http://HomebrewersAssociation.org/clones)

"Trying to limit the selection of my favorite beers down to 20 is exponentially harder than voting for our next president (looks like I'll be writing in Ross Perot)," commented Hans Muecke of Aurora, Ill. "A huge shout out to the craft brewers everywhere who continue to amaze me with their creativity and inspire me to be a better homebrewer."

**Hop Heads**

One thing remains constant in this (and pretty much every) year's poll: hops are still king among our voters. Of the top 10 beers, eight are IPAs, double IPAs, or pale ales, with a couple of stouts sneaking their way in.

Topping them all, once again, was the gold standard for many of our members: Pliny the Elder. This double IPA has attained an almost cult-like status, distributed only in northern and southern California, Oregon, Colorado, and Philadelphia, with about 50 percent of production going to the Russian River brewpub in Santa Rosa, Calif.

"We just don't expect this each year, especially in this age of great beer and new breweries," said Russian River co-owner and brewmaster Vinnie Cilurzo of the honor. "We know we have to earn our customers' loyalty and business. We are very thankful for everyone who spends their hard-earned money on our beer."

Pliny the Elder is brewed with Amarillo, Centennial, Columbus/Tomahawk/Zeus (CTZ), and Simcoe hops, and checks in at 8 percent ABV.

"After all these years, this is still a style-defining, world-class, revolutionary beer," commented Thomas Timkanic of Palm Harbor, Fla. "I never get tired of it and am always amazed at how the beer exhibits a pure hop experience. Long live Pliny!"

"Finally had a chance to try it, and it lived up to the hype," commented Steve Conrad of Minneapolis, Minn.

Finishing second for the seventh straight year was Two Hearted Ale, an IPA from Bell's Brewery in Kalamazoo, Mich. Two Hearted Ale showcases Centennial hops, checking in at 7 percent ABV.

"Simply incredible!" described Derek Zomonski of Kalamazoo, Mich. "One of the world's greatest multi-taskers. Enough weight, impact, and flavor for the cold months with enough brightness, bitterness, and acidity for those warmer days."

Heady Topper, a double IPA from The Alchemist in Waterbury, Vt., jumped into the third spot after finishing sixth last year, while a pair of beers from Ballast Point—Sculpin IPA and Grapefruit Sculpin—rounded out the top five.

**New Kids on the Block**

Some of the newcomers in this year's poll aren't necessarily new breweries, but their beers were deemed among the best of the best. Sip of Sunshine from Lawson's Finest Liquids had an impressive debut in the top 50, vaulting into the 14th spot.

"Sip is the greatest beer made on planet earth, no question about it," proclaimed Peter Blythin of Fort Collins, Colo. Sip of Sunshine is described as "a tropical vacation in a glass" by the brewery.

Sean Lawson was a homebrewer for 20 years before starting Lawson's Finest Liquids in Warren, Vt. As Lawson is a one-man show in the brewery, brewing on a 7-barrel system, he enlisted the help of Two Roads Brewing in Stratford, Conn. to help ramp up production. Sip of Sunshine, a double IPA hopped with Citra, is a variation of Lawson's Double Sunshine.

"I couldn't be more thrilled that it's landed on the radar of homebrewers," Lawson said. He said Sip of Sunshine has somewhat of an identity crisis, as it has the flavor and aroma of a double IPA, but the drinkability of an IPA. "Sip of Sunshine has an overpowering floral, tropical fruit bouquet," Lawson said. "One of my favorite things about it is the aroma—it jumps out of the glass."

At press time, Lawson's Finest Liquids was in the process of purchasing warehouse buildings and property in Waitsfield, Vt. for a new, expanded brewery.

Tree House Brewing in Monson, Mass., which is building a new brewery in 2016, saw its Julius—an IPA with notes of passionfruit, mango, and citrus—jump into the top 50.

## TOP BREWERIES

(T indicates Tie)

1. Russian River Brewing Co.,  
Santa Rosa, Calif.
2. Founders Brewing Co.,  
Grand Rapids, Mich.
3. Bell's Brewery, Inc.,  
Kalamazoo, Mich.
4. Stone Brewing Co.,  
Escondido, Calif.
5. Sierra Nevada Brewing Co.,  
Chico, Calif. and Mills River, N.C.
6. Firestone Walker Brewing Company,  
Paso Robles, Calif.
7. Ballast Point Brewing,  
San Diego, Calif.
8. Dogfish Head Craft Brewery,  
Milton, Del.
9. Lagunitas Brewing Company,  
Petaluma, Calif. and Chicago, Ill.
10. Deschutes Brewery,  
Bend, Ore.
11. Avery Brewing Co.,  
Boulder, Colo.
12. Three Floyds Brewing Co.,  
Munster, Ind.
13. New Belgium Brewing,  
Fort Collins, Colo. and Asheville, N.C.
14. Goose Island Beer Co.,  
Chicago, Ill.
15. Surly Brewing Co.,  
Minneapolis, Minn.
16. Oskar Blues Brewery,  
Longmont, Colo. and Brevard, N.C.
17. The Alchemist,  
Waterbury, Vt.
- T18. Boulevard Brewing Co.,  
Kansas City, Mo.
- T18. Odell Brewing Co.,  
Fort Collins, Colo.
20. New Glarus Brewing Co.,  
New Glarus, Wis.
21. Cigar City Brewing,  
Tampa, Fla.
22. Victory Brewing Co.,  
Downington, Pa.
23. Left Hand Brewing Co.,  
Longmont, Colo.
24. Tree House Brewing,  
Monson, Mass.
25. Tröegs Independent Brewing,  
Hershey, Pa.



Find a clone recipe for Pliny the Elder on our website @ [HomebrewersAssociation.org/pliny16](http://HomebrewersAssociation.org/pliny16)



## BEST PORTFOLIO

(T indicates Tie)

1. Stone Brewing Co.,  
67 beers
- T2. Bell's Brewery, Inc.,  
47 beers
- T2. Sierra Nevada Brewing Co.,  
47 beers
4. Avery Brewing Co.,  
42 beers
5. New Belgium Brewing,  
41 beers
6. Dogfish Head Craft Brewery,  
39 beers
- T7. Firestone Walker Brewing Company,  
38 beers
- T7. The Bruery,  
38 beers
9. Boulevard Brewing Co.,  
37 beers
10. Founders Brewing Co.,  
33 beers

"The most perfect balance of sweetness, hoppiness, and malt without any one outdoing the other," commented Brett Dilley of Erie, Colo. "Best beer I have ever had." Toppling Goliath Brewing Co., Prairie Artisan Ales, and Maine Beer Co. also had beers appear in the poll for the first time.

### A Way of Life

Craft beer has woven its way into the fabric of beer drinkers' everyday lives. A sampling of beers deemed worthy of the journey:

Port Jefferson Party Boat: "My go-to IPA. Literally. I walk my dogs there and have one of these at least once a week!" (Eric Hohenschuh, Port Jefferson, N.Y.)

Odell IPA: "This is one of the best IPAs on the market. Now it's in cans. It will go on

every camping trip this summer."  
(Derek Heersink, Fort Collins, Colo.)

Founders Centennial IPA: "I love this 'lighter' IPA. I served it at my daughter's wedding." (Mark Malnor, Grand Rapids, Mich.)

Sierra Nevada Celebration: "This beer is one of the highlights of my holiday season. I love the rich, fresh hop flavor." (John Merten, Boones Mill, Va.)

Avery White Rascal: "Love this Belgian-style beer. Refreshing and light. Perfect on a warm spring day on the patio." (Ryan Anderson, Parker, Colo.)

Good People Pale Ale: "This is the perfect everyday drinker and serves as my house beer." (Daniel Reid, Birmingham, Ala.)

### Above the Rest

In the top breweries division, Russian River received the most votes for the third straight year. The brewery placed five beers in the top 50, including Pliny the Elder, Blind Pig IPA, Consecration, Supplication, and Pliny the Younger.

Cilurzo recently announced that Russian River is building a new production facility and brewpub. "Because we do so much business out of our brewpub and it is obvious that we are bursting at the seams, Natalie and I have decided to build a new production brewery that will have a fantastic customer experience along with a second brewpub," he said. "Nothing will change at our current brewpub, except that maybe it will be easier to get a seat at the bar."

The new brewery is still a couple years down the road. "We aren't going to blow production up, but we certainly will expand distribution a little in California," Cilurzo said.

Jumping into the number two spot after finishing fourth last year was Founders Brewing Co. in Grand Rapids, Mich., which had four beers in the top 50, including its popular Breakfast Stout and Kentucky Breakfast Stout (KBS). Bell's Brewery rounded out the top three.

Thomas Noonan of Southbury, Conn. described Founders Breakfast Stout as

"the perfect example of what an oatmeal stout should be."

## Well-Rounded

As far as Best Portfolio, Stone Brewing Co. in Escondido, Calif. blew away the competition with 67 of its beers receiving votes. Bell's and Sierra Nevada tied for second with 47 beers.

"Wow, that is amazing news and quite an honor!" exclaimed Stone brewmaster Mitch Steele. "We've really put a lot of focus on innovation over the last few years, especially now that we have a five-barrel pilot brewery in Escondido and a 10-barrel brewhouse at Stone Brewing World Bistro & Gardens – Liberty Station. Both of these give us the opportunity to really experiment with new ingredients and develop cool beer recipes."

Stone was planning to release its new seasonal, Stone Mocha IPA, in June, and Steele gave a sneak preview of the Stone 20th Anniversary IPA, which he said will be "massively hoppy—big surprise—and also highlights a really cool, local San Diego ingredient."

Steele said recipe development is usually inspired first by new hops and malts. "Typically, the beer styles we brew are driven by any unique ingredients that we feel are interesting and delicious, and we certainly continue to take inspiration from the very creative homebrewing community as well."

## Foreign Affairs

As has been the recent trend, no beers produced by breweries outside of the U.S. made the top 50. La Fin du Monde, a tripel brewed by Quebec, Canada brewery Unibroue, was the top import for the third straight year.

"Even with all the new brews out there, La Fin du Monde continues to be unrivaled for smoothness and complexity in a tripel-style ale outside of Belgium," commented Harvey Raben of Austin, Texas.

Also for the third straight year, Abt 12, a Belgian quad brewed by St. Bernardus brewery in Watou, Belgium, placed second, tying with Guinness Draught for that position this year.



## TOP IMPORTS

(T indicates Tie)

1. Unibroue La Fin du Monde (Canada)
- T2. St. Bernardus Abt 12 (Belgium)
- T2. Guinness Draught (Ireland)
4. Saison Dupont (Belgium)
- T5. Orval (Belgium)
- T5. Rodenbach Grand Cru (Belgium)
7. Chimay Grande Reserve/Blue Label (Belgium)
8. Duchesse De Bourgogne (Belgium)
9. Westvleteren XII (Belgium)
10. Samuel Smith Oatmeal Stout (England)

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"It's a classic style, made by a titan in the field," commented Matthew Joyce of Brooklyn, N.Y. "And as far as examples go, the Abt 12 is the finest example of the dark Belgian style I've ever had. It's world-recognized, and while it isn't new and sexy, it is a complex beer that has been perfected over a very long time."

## Recipes

As usual, we're providing clone recipes for some of the top beers in the poll. Zymurgy associate editor Amahl Turczyn put together homebrew recipes for Boulevard Tank 7, Fat Head's Head Hunter IPA, and Ballast Point Grapefruit Sculpin. Give them a try and let us know what you think!

The recipe for Pliny the Elder appeared in the July/August 2014 issue, and Bell's Two Hearted Ale was published in the July/August 2011 issue. We've also published clone recipes in the past for many others

*Continued on page 36 >*

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## Fat Head's Head Hunter IPA Clone

Recipe by Amahl Turczyn, based on a recipe in Mitch Steele's *IPA: Brewing Techniques, Recipes and the Evolution of India Pale Ale*

### INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

<b>6.75 lb.</b>	(3 kg) Pale 2-row malt
<b>3.38 lb.</b>	(1.5 kg) Maris Otter pale malt
<b>13 oz.</b>	(369 g) Weyermann Carahell malt
<b>13 oz.</b>	(369 g) 15° L crystal malt
<b>11 oz.</b>	(312 g) Dextrose
<b>4 oz.</b>	(113 g) Dextrin malt
<b>5 ml</b>	(0.17 oz.) Liquid CO <sub>2</sub> hop extract (90 min)
<b>0.25 oz.</b>	(7 g) Centennial, 10% a.a. (45 min)
<b>0.25 oz.</b>	(7 g) Simcoe, 13% a.a. (45 min)
<b>0.25 oz.</b>	(7 g) Centennial, 10% a.a. (30 min)
<b>0.25 oz.</b>	(7 g) Simcoe, 13% a.a. (30 min)
<b>1 oz.</b>	(28 g) Centennial, 10% a.a. (steep 10 min)
<b>1 oz.</b>	(28 g) Simcoe, 13% a.a. (steep 10 min)
<b>1 oz.</b>	(28 g) Columbus, 14% a.a. (steep 10 min)
<b>2 oz.</b>	(56 g) Centennial, 10% a.a. (dry hop 10 days)
<b>2 oz.</b>	(56 g) Simcoe, 13% a.a. (dry hop 10 days)
<b>2 oz.</b>	(56 g) Columbus, 14% a.a. (dry hop 10 days)

California/American ale yeast, 2 L starter

**Original Gravity:** 1.070 (17° P)

**Final Gravity:** 1.015 (3.8° P)

**Color:** 6 SRM

**IBUs:** 87

**ABV:** 7.5%

**Boil Time:** 90 minutes

**Brewhouse Efficiency:** 76%



### DIRECTIONS

Lightly toast wheat flakes. Treat reverse osmosis water with 2 tsp. gypsum and mash at 150° F (66° C) for 75 minutes. Ferment at 67° F (19° C) for 10 days. After fermentation is complete, rack onto dry hops and steep for 10 days.

### MALT EXTRACT VERSION

Substitute 8 lb. (3.63 kg) extra-pale malt extract syrup for pale 2-row malt, Maris Otter, and flaked wheat. Steep dextrin, Carahell, and caramel malts in 155° F (68° C) water for 30 minutes. Rinse, dissolve extract completely, and proceed with boil.

## Boulevard Tank 7 Clone

Recipe by Amahl Turczyn

### INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

<b>6.25 lb.</b>	(2.83 kg) Extra-pale malt extract syrup
<b>3 lb.</b>	(1.36 kg) Pale 6-row malt
<b>2.81 lb.</b>	(1.27 kg) Flaked corn
<b>6 oz.</b>	(170 g) White wheat malt
<b>1 lb.</b>	(450 g) Corn sugar (in primary)
<b>0.24 oz.</b>	(6.8 g) Magnum, 10% a.a. (60 min)
<b>0.2 oz.</b>	(5.7 g) Simcoe, 13% a.a. (55 min)
<b>3 oz.</b>	(85 g) Amarillo, 8.5% a.a. (5 min)
<b>2.25 oz.</b>	(64 g) Amarillo, 8.5% a.a. (whirlpool)
<b>0.5 oz.</b>	(14 g) Amarillo, 8.5% a.a. (dry hop 3 days)
White Labs WLP670 American Farmhouse Blend ale yeast or	
Wyeast 3724 Belgian Saison, 2 L starter	
<b>1 cup</b>	(207 g) Corn sugar to prime (if bottling)

**Original Gravity:** 1.071 (17.3° P)

(before sugar addition in primary)

**Final Gravity:** 1.009 (2.3° P)

**Color:** 4 SRM

**IBUs:** 37 IBU

**ABV:** 8.5%

**Boil Time:** 70 min

**Brewhouse Efficiency:** 75%

### PARTIAL-MASH RECIPE

Mash 6-row, flaked corn, and malted wheat at 150° F (66° C) for 45 minutes. Rinse grains and dissolve extract completely. Boil 70 minutes. Cool to 67° F (19° C) and pitch starter (Boulevard uses a proprietary house Belgian yeast; the suggested strains are purportedly closest in character). Ferment at 70° F (21° C) until high kräusen.



One day later, boil 1 lb. corn sugar (or 1.5 lb. if kegging) with enough water to dissolve, then cool and add to primary. Ferment until terminal gravity of 1.009 is reached. Rack on to dry hops and hold 3 days. If bottling, prime with 1 cup (207 g) of corn sugar at packaging for approximately 3.3 volumes of CO<sub>2</sub>. If kegging, force carbonate to 3.3 volumes.

### ALL-GRAIN VERSION

Substitute 11 lb. (5 kg) domestic pale 2-row malt for 6-row and malt extract. Mash 2-row, corn, and wheat malt at 146° F (63° C) for 50 minutes. Raise to 155° F (68° C) and hold for 25 minutes. Raise to 163° F (73° C) and hold 15 minutes. Mash out at 168° F (75° C). Collect wort and proceed as above.



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## Ballast Point Grapefruit Sculpin Clone

Recipe by Amahl Turczyn

### INGREDIENTS

for 5.5 U.S. gallons (20.8 L)

<b>10 lb.</b>	(4.54 kg) Extra-pale malt extract syrup
<b>10 oz.</b>	(283 g) 80° L crystal malt
<b>8 oz.</b>	(227 g) Weyermann CaraRed malt
<b>3 ml</b>	(0.1 oz.) Liquid CO <sub>2</sub> hop extract (60 min)
<b>0.5 oz.</b>	(14 g) Chinook, 13.1% a.a. (60 min)
<b>0.5 oz.</b>	(14 g) Chinook, 13.1% a.a. (20 min)
<b>0.5 oz.</b>	(14 g) Cascade, 6.5% a.a. (20 min)
<b>0.5 oz.</b>	(14 g) Chinook, 13.1% a.a. (5 min)
<b>0.5 oz.</b>	(14 g) Cascade, 6.5% a.a. (5 min)
<b>0.5 oz.</b>	(14 g) Chinook, 13.1% a.a. (whirlpool 10 min)
<b>1 oz.</b>	(28 g) Amarillo, 6.5% a.a. (whirlpool 10 min)
<b>1 oz.</b>	(28g) Simcoe, 13.1% a.a. (dry hop 7 days)
<b>1 oz.</b>	(28 g) Cascade, 6.5% a.a. (dry hop 7 days)
<b>0.25 cups</b>	(60 ml) fresh-grated grapefruit peel (steep 7 days)

California/American ale yeast, 2 L starter

**Original Gravity:** 1.070 (17° P)

**Final Gravity:** 1.016 (4° P)

**Color:** 9 SRM

**IBUs:** 70

**ABV:** 7%

**Boil Time:** 60 min

**Brewhouse Efficiency:** 75%

### DIRECTIONS

Steep crystal and CaraRed malts at 160° F (71° C) for 30 minutes. Rinse grains, dissolve extract completely, and boil for 60 minutes. Ferment at 68° F (20° C) until terminal gravity is reached. Use a Microplane® grater to remove zest from fresh grapefruit rinds (about 6 large fruits) without cutting into white pith, and add to finished beer (a hop screen or tea ball is recommended). Zest will be oily, but don't worry—oils should not affect foam

retention. Add dry hops. Steep in fermenter at 68° F (20° C) for 7 days, then rack clear beer off solids and package.



### ALL-GRAIN VERSION

Substitute 13 lb. (5.9 kg) pale 2-row malt for malt extract syrup. Mash at 150° F (66° C) for 60 minutes, and proceed as above.

in the top 50. Search the Zymurgy index at HomebrewersAssociation.org to find the specific issues for recipes for some of those beers.

Thanks to all AHA members who voted in this year's poll, and for your insightful comments that helped tell the story of Zymurgy's Best Beers in America.

**Jill Redding** is the former editor-in-chief of *Zymurgy*. She is editor-in-chief of *The New Brewer*, the journal of the Brewers Association.

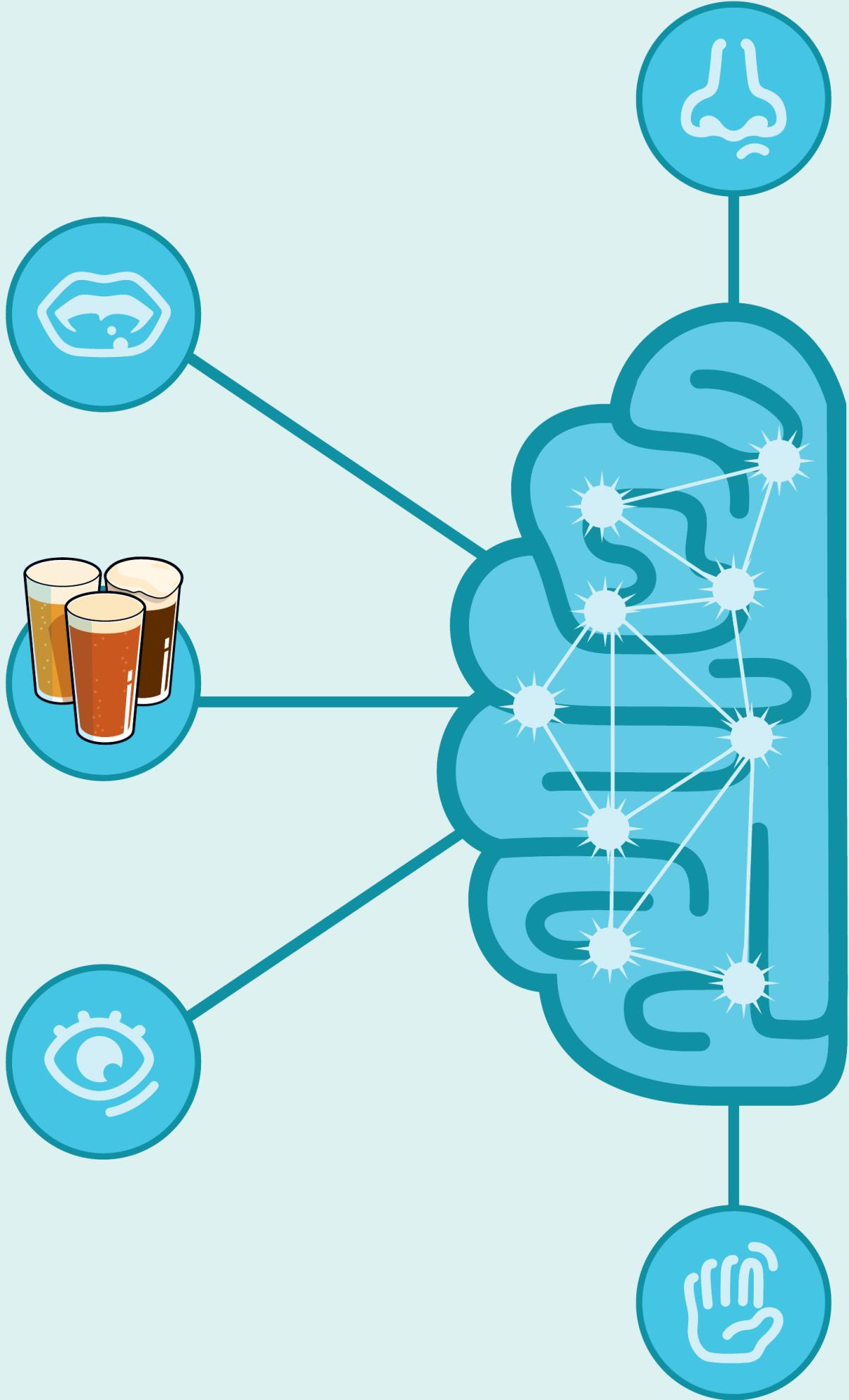


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# Come to Your Senses

By Kevin Wright

Brew Better Beer  
with Sensory Evaluation



Hombrewers and professionals alike strive to brew the best beer possible. It's easy to assume that high quality can only be achieved with sophisticated production equipment and high-tech measuring devices. After all, large professional brewers use specialized tools all the time, and, without a doubt, such instruments can and do help them produce excellent beer. However, another tool can trump all of these fancy toys, and it is available to any brewer at any level. To find it, just look in the mirror.

Sensory evaluation is a scientific discipline used to measure, analyze, and interpret reactions to characteristics of foods (including beer) as perceived through the senses of sight, smell, taste, touch, and hearing. This is the secret weapon that

quality assurance departments in breweries worldwide keep in their tool chests. Sensory evaluation allows humans to generate information that brewers can use to help them make better beer.

In an age when we have machinery that can identify and quantify every volatile component in a beer sample, we might wonder, "Why use humans at all?" The answer is that the human palate is more sensitive than any machine yet created. We also have the unique ability to combine sensations of aroma, flavor, mouthfeel, and aftertaste and deliver an overall assessment of how they all play together. No machine can do that.

Furthermore, humans can actually comprehend what they experience. A machine

might detect 40 parts per billion (ppb) of diacetyl, but it can't tell you how the consumer might perceive it. This is why most breweries rely on tasting panels of trained humans to help identify and describe the beers they produce.

*Trained humans* is the key term when speaking about sensory evaluation. It's a scientific discipline, just like microbiology and organic chemistry, so there needs to be a method to provide information that is actually valuable. We must transform ourselves from beer drinkers to beer analysts in the name of good beer and science. Fortunately, training yourself in sensory science and beer evaluation is not just enjoyable, but also fairly easy to start, even though it may take a lifetime to master.



## Set Some Ground Rules

To begin, we need to establish some guidelines. Tastings should be conducted in a relatively distraction-free environment, and participants should follow an agreed-upon method to evaluate every sample, every time. This method should include a visual inspection, sniffing the sample (two to three short sniffs are better than a long, deep smell for evaluating aroma), and finally sipping and swallowing. That sequence can be modified, but try to follow the same protocol for each beer or each time you taste.

Make notes on the color, clarity, foam appearance, aroma, flavor, mouthfeel,

aftertaste, and any other categories you find useful. If tasting in a group setting (which is highly recommended), make sure all tasters have a chance to evaluate their samples and make notes before discussing the details of what everyone tasted. Some people may even create a standard evaluation form that they use each time they taste beers.

While humans offer many advantages over machines, we also suffer from a major weakness: bias. Some of these can be fairly obvious, as in our personal preferences for certain styles of beer, but others may be less obvious. We might have expectations for flavors or aromas because

we know we included certain ingredients in the recipe. Or we target a style or flavor profile and trick ourselves into describing what we intended instead of what we taste. Our palates can become fatigued if we sample lots of different beers in succession, and we may lose sensitivity to a certain flavor over time—hoppy beers that arrive later in a flight might seem less hoppy than those that came earlier.

It is important to try to approach every tasting with a completely open mind. Take the time to evaluate each beer on its own merits and not on expectations. Overcoming these biases is one of the hardest things to do, and many never fully

## Hop Trial

Kevin Wright

Hop Trial is designed to help you evaluate the flavor and aroma characteristics of a single hop variety. This example features Target hops, but you can use any hop variety you like. Simply adjust the 60-minute hop addition up or down as needed to achieve about 35 IBUs, and swap out the whirlpool and dry hops ounce-for-ounce with what is printed here. If you build your own wort, target 50–100 ppm chloride and 75–150 ppm sulfate.

### INGREDIENTS

For 5.5 U.S. gallons (20.82 L)

<b>6.25 lb.</b>	(2.83 kg) Pale malt extract syrup
<b>0.75 lb.</b>	(340 g) Munich malt extract syrup
<b>8 oz.</b>	(227 g) 35° L English caramalt (5.2%)
<b>1 oz.</b>	(28 g) Target pellets (10.7% a.a.), boil 60 min (35 IBU)
<b>1.5 oz.</b>	(35 g) Target pellets (10.7 a.a.), steep/whirlpool 10 min (10 IBU)
<b>2 oz.</b>	(57 g) Target pellets (10.7 a.a.) dry hop 5 days (0 IBU)
American/Chico ale yeast (1.5 L starter)	

**Original Gravity:** 1.048 (12° P)

**Final Gravity:** 1.008 (2° P)

**IBUs:** 45

**SRM:** 5.7

**ABV:** 4.9%

**Assumed Brewhouse Efficiency:** 75%



### DIRECTIONS

Crush and steep English caramalt in 160° F (71° C) water for 30 minutes. Drain, rinse grains, and add extracts to wort. Proceed with a 60-minute boil and add final hops at flameout. Add steep/whirlpool hops and stir continuously or use a pump to keep the hops in suspension as you whirlpool. Assuming wort remains over 180° F (82° C) for the 10-minute whirlpool, isomerization will continue, adding to total IBUs. Chill to 68° F (20° C), aerate and pitch yeast starter. Ferment at that temperature until final gravity is reached.

### ALL-GRAIN VERSION

Substitute 8 lb. (3.63 kg) pale domestic 2-row, 1 lb. (0.45 kg) 10° L Munich malt, and 3 oz. (85 g) acidulated malt for pale and Munich malt extracts. Mash at 150° F (66° C) for 75 minutes. Collect wort and proceed with boil.

## Common Flavor and Aroma Compounds and How to Mimic Them

Flavor Attribute	What It Smells and Tastes Like	Where It Comes From	What You Can Use To Mimic It
Diacetyl	Butter, buttered popcorn	Produced by yeast during fermentation	Artificial butter flavor (in the spice aisle)
Dimethyl Sulfide (DMS)	Canned corn, canned vegetables	Malt precursors	Liquid from a can of corn
Acetic acid	Vinegar	Bacterial contamination	White vinegar
Lactic acid	Sour milk	Bacterial contamination	Lactic acid (available at most homebrew stores)
Isoamyl acetate	Bananas	Some yeasts produce (hefeweizen or wild)	Artificial banana flavor (in the spice aisle)
Sweet (cloying)	Malty, sugary	Under-attenuation	Malt extract
4-vinyl guaiacol (phenolic)	Spicy, clove-like	Some yeasts produce (hefeweizen or wild)	Ground cloves (mix with a little water)
Oxidation	Paper, wet cardboard	Exposure to oxygen after fermentation	Beer that has been opened and left out overnight

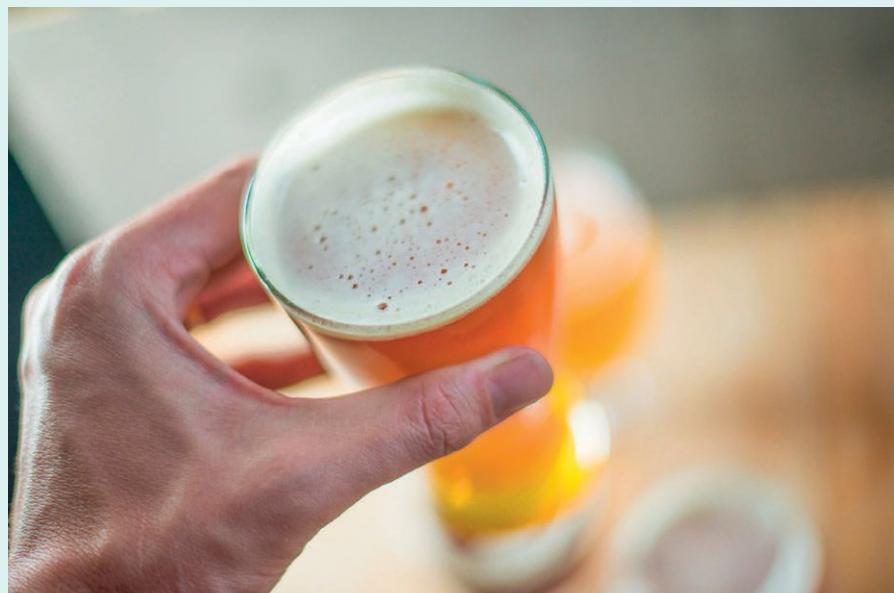
overcome them. But doing so will make you a superior beer evaluator.

### Trust Your Senses

After we have our evaluation atmosphere down and are overcoming (or at least are aware of) our biases, the next step is developing a sensory vocabulary. We all remember the five senses from grade school: sight, touch, hearing, taste, and smell. Each of these senses relies on receptors that transmit stimuli from the environment through sensory nerves to the brain, where they become perception.

All of these (with the possible exception of hearing) play a role in our evaluation of beer. The key is to take these perceptions and change them into vocabulary terms that make sense to everyone. Developing a vocabulary for what you perceive is a critical step in training yourself in sensory evaluation.

Sight is probably the easiest one, as we are largely visual creatures. I could show you an apple and ask you to describe it, and you could probably carry on for quite a while talking about the color, the shape, and so on. Taste, smell, and touch sensations are more difficult to put into words.

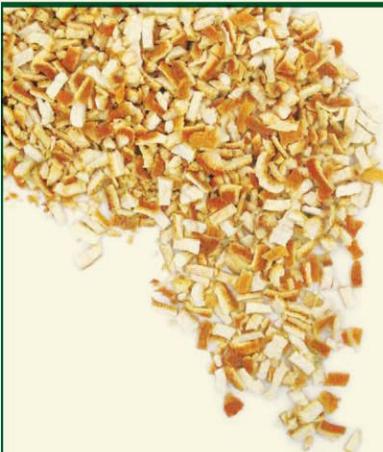


Asked to describe the smell of that apple, you might say, "I don't know, it smells like an apple," even though the chemical makeup of the apple's aroma is more complicated than its appearance.

Describing what we smell is difficult because the region of our brain where we perceive smell is not linked to our language center as sight is. Instead, smell is linked to memory and emotions, which is

why a scent can immediately take us back to a distant memory, and often the emotions connected to that memory. We must train ourselves to develop a vocabulary for what we smell.

We focus so much on smell because most of what we perceive as "flavor" is actually aroma-based rather than taste-based. We can only detect a few basic tastes—sweet, salty, bitter, sour, umami—but we can



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detect more than 10,000 different odors. You can easily test this. Plug your nose, put a piece of fruit-flavored candy in your mouth, and start to chew. You will get some sweetness and maybe a little acidity, but not much else. Unplug your nose and boom! Flavortown!

So how can we improve our ability to express what we smell? One easy way is to practice with household items. Grab some spice jars from your pantry. Open and smell each one without looking at the labels. Try to identify the spices on smell alone. Have a family member place other food items in jars and try to identify them by smelling. You will be surprised by how hard this might be at first but, with practice, you will get better.

### Taste Lots of Beer

Once you've mastered the spice cabinet, move on to beer. Try to write down as many words as you can for what you smell. Afterwards, make use of resources like the beer flavor wheel to see if any of the descriptive terms jogs your brain. Often, you'll experience a "that's-what-I-was-smelling-but-couldn't-put-a-word-on-it" moment. This will also happen when you taste with a group of more experienced tasters. Building a vocabulary for beer aromas and flavors takes time and practice—you need to drink a lot of beer to get good at it!

After establishing these basic guidelines and tasting your fair share of beers, you'll be well on your way to improving your abilities as a beer evaluator. But how can you take this to the next level? A great way to gain a lot of sensory knowledge is to organize group tastings. You will gain the benefit of having many contributors to the conversation, and you'll generate more sensory data for each sample, which will hopefully help you overcome the bias you naturally experience when you evaluate your own beer. To limit bias, try not to give too much information on the beers being sampled.

Another way to improve is to volunteer at homebrew competitions. These competitions often want experienced and credentialed individuals for judging, but they may let novices volunteer as judging assistants (stewards). Competitions offer a great way to interact with experienced tasters and improve your beer knowledge and vocabulary. Investing in some literature is also a good way to learn. *Tasting Beer* by Randy Mosher is a fantastic resource that delves much deeper into beer flavors and attributes.

### Develop Your Palate Palette

Speaking of beer flavors, one way to really hone your palate is to brew targeted "trial batch" beers. Just start with a stock recipe and change one variable

every time you brew it to evaluate the effect of that change on the finished beer. Hop trial brewing is a classic example: swapping out the hop variety while keeping all other variables the same helps you identify the aromas and flavors of a specific hop (see the accompanying recipe). You can also do this for yeast, varying strains, pitching rates, and fermentation temperatures to get different results. I've found this works really well with Belgian yeasts.

It can be hard to identify certain beer flavors without having a reference. We may hear or read terms like *diacetyl* or *dimethyl sulfide* (DMS), but without experiencing them, it is hard to imprint the flavors in our brain. A number of companies sell pure flavor spikes that can be added to beer or water to use as references. Siebel Institute, FlavorActiv, and AROXA make great products that can really elevate a tasting. Flavor kits are not cheap, though; they're best used in a large group where everyone can chip in and share the benefits.

It's also possible, to mimic some sensory attributes using more readily available (and cheaper) substitutes. See the accompanying table for some common flavor attributes that can be achieved using easy-to-find items. For each, add a few drops to a neutral-flavored beer—American adjunct light lager works well. Evaluate the sample, and if you can't smell or taste anything, add more drops until you can perceive it.

Sensory evaluation is an essential tool that can help any brewer at any level make better beer. By working on your biases, cultivating a descriptive vocabulary, and learning to identify common flavors—not to mention sampling a wide variety of beers—you can turn yourself into an expert taster in no time.

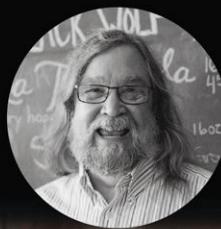
**Kevin Wright is the co-founder and brewmaster for Third Space Brewing in Milwaukee, Wis. Prior to that, he served as director of brewing for Hangar 24 Brewery in Redlands, Calif. Kevin enjoys honing his sensory skills at the many great beer spots around Milwaukee.**

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# The Role of TEMPERATURE in Flavor Perception of Beer

By Chris Bible

**B**eer flavor perception is complex and involves all of our senses, but "flavor" generally refers to what we perceive with our senses of taste and smell. Temperature plays an important role in our total organoleptic beer experience because it affects our perception of both taste and aroma intensity. In general, beer that is served warmer will be perceived as having a greater intensity of both taste and aroma than beer served cooler.

## How Temperature Affects Taste Buds

We experience the sensation of taste when flavor-active molecules stimulate special sensory cells in the mouth and throat. These taste cells are clustered within the taste buds of the tongue, the roof of the mouth, and the lining of the throat. When taste cells are stimulated, they send messages through three specialized taste nerves to the brain, and the brain sorts out which specific tastes are being experienced.

Each taste cell contains a receptor, which responds to one of at least five basic tastes: sweet, sour, bitter, salty, and umami. Taste reception occurs at the tip of taste cells that form taste buds, and each taste bud, in turn, contains 50 to 100 taste cells representing all five taste sensations. Embedded in the cell membranes of these taste cells are transmembrane receptor proteins that either physically bind to flavor molecules or act as channels that allow ions to flow directly into taste cells. This interaction triggers a signaling cas-

cade to the brain via a network of taste nerve fibers.

Researchers have shown that temperature directly affects how our tongue perceives the intensity of sweet, bitter, and umami taste sensations.<sup>1</sup> A receptor protein in our taste buds called TRPM5 is a key component in the biochemistry of taste perception and is also sensitive to temperature. Perception of the intensity of sweet, bitter, and umami sensations increases when the temperature of TRPM5 increases. Researchers are not clear on the specific biochemical mechanism responsible for this, but the direct link between increasing temperature and increasing taste perception is well-established.

## How Temperature Affects Aroma

Although taste is important to our perception of flavor, aroma plays an even greater role. Our ability to smell the myriad aroma compounds in beer relies on specialized cells called olfactory sensory neurons. These special cells are found in a



small patch of tissue high inside the nose, and they connect directly to the brain. Aroma molecules can reach the sensory cells within the nasal cavity either through your nostrils, or through a channel that connects the throat region to the nasal cavity. When we swallow beer, aromas are released that access the olfactory sensory neurons through this channel. When the sensory neurons detect aroma-active molecules, they send messages to our brain, which then interprets the signals and identifies the aroma.

Beer contains hundreds of different volatile, aroma-active compounds, and many of these compounds contribute to the overall aroma of beer.<sup>2</sup> Categories of aroma compounds include alcohols, esters, vicinal diketones, sulfur compounds, and hop constituents. A list of some of the compounds that contribute to the aroma of beer, their associated typical concentrations within beer, and their corresponding aroma or flavor descriptors is provided in Table 1.<sup>3</sup>

### Variables that are Important to Aroma Perception

Perception of aroma intensity is directly related to the concentration of the aroma-active molecules that are present in the vapor phase. Higher concentrations are perceived as stronger or more intense.

Three things greatly affect the concentration of aroma-active compounds in the vapor phase above a liquid: concentration of the compound in the liquid phase, vapor pressure of the compound, and the molecular interactions between the aroma-active compounds and the other molecular species in the beer.

The concentration of aroma-active compounds in beer directly affects the concen-

tration of aroma compounds in the vapor phase above the liquid. And a higher concentration of a compound in the liquid phase yields a higher concentration in the vapor phase.

Vapor pressure refers to the tendency of a molecular species to escape from the liquid in which it is dissolved and form a vapor phase above the liquid. A compound with a high vapor pressure will have a higher concentration of the compound in the vapor phase for any given temperature than one with a low vapor pressure. Figure 1 illustrates this concept.

Molecular interactions between aroma compounds and other compounds dissolved in beer also affect vapor phase concentration. If there is a strong, attractive interaction between the aroma compound in question and the other compounds in solution, then the concentration of the aroma compound in the vapor phase will be lower than expected under conditions when this interaction is not present. It will be “held in” somewhat by the attractive forces of the other compounds in the solution. Conversely, if there are strong, repulsive interactions, then the concentration of aroma compounds in the vapor phase will be higher than when this interaction is not present.

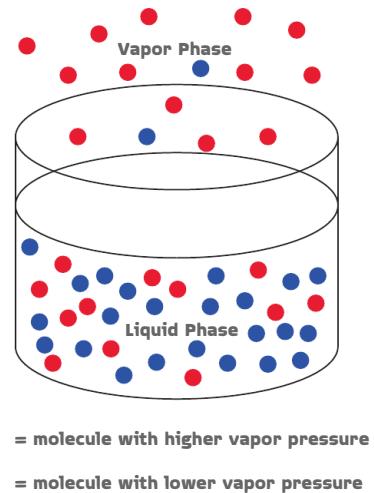
The amount of a molecular species present in the vapor phase above the liquid in which it is dissolved can be expressed by Raoult's Law,<sup>4</sup>

$$y_i = \frac{\gamma_i x_i P_i^{sat}}{P}$$

where

- $y_i$  is the mole fraction of species  $i$  in the vapor phase
- $y_i$  is the activity coefficient of species  $i$  ( $y_i = 1$  for an ideal solution)

**Figure 1:**  
**High vs. Low Vapor Pressure**



- = molecule with higher vapor pressure
- = molecule with lower vapor pressure

- $x_i$  is the mole fraction of species  $i$  in the liquid phase
- $P_i^{sat}$  is the saturation pressure or vapor pressure of species  $i$
- $P$  is the absolute pressure of the system

The vapor pressure term,  $P_i^{sat}$ , in the numerator of the equation is strongly temperature-dependent. Increasing the temperature increases the vapor pressure of aroma compounds and causes them to have a higher concentration in the vapor phase. The relationship between temperature and vapor pressure for volatile compounds is typically nonlinear, and many different empirical equations have been developed to describe the relationship. One equation in wide use is the Antoine equation,<sup>5</sup>

$$\log p = A - \frac{B}{t + C}$$

where

- $\log p$  is the base ten logarithm of pressure expressed in millimeters of mercury (mmHg)
- **A, B, and C** are experimentally determined constants
- $t$  is the temperature expressed in Celsius.

**Table 1: Some Typical Aroma Compounds in Beer**

Compound	Typical Concentrations in Beer (mg/liter or ppm by weight)	Descriptors
<b>Alcohols</b>		
Methanol	0.5–3.0	Alcoholic, solvent
Ethanol	20,000–80,000	Alcoholic, strong
1-Propanol	3–16	Alcoholic
2-Propanol	3–6	Alcoholic
2-Methylbutanol	8–30	Alcoholic, vinous, banana
3-Methylbutanol	30–70	Alcoholic, vinous, banana
2-Phenylethanol	8–35	Roses, bitter, perfume
1-Octen-3-ol	0.03	Fresh-cut-grass, perfume
2-Decanol	0.005	Coconut, aniseed
Glycerol	1200–2000	Sweetish, viscous
Tyrosol	3–40	Bitter, chemical
<b>Esters</b>		
Ethyl acetate	10–60	Solvent-like, sweet
Isoamyl acetate	0.5–5.0	Banana, solvent
Ethyl hexanoate	0.1–0.5	Apple, fruity, sweet
Ethyl octanoate	0.1–1.5	Apple, tropical fruit, sweet
2-Phenylethyl acetate	0.05–2.0	Roses, honey, apple, sweet
Ethyl nicotinate	1.0–1.5	Grainy, perfume
<b>Vicinal diketones (or reduced compounds)</b>		
2,3-Butadione	0.01–0.4	Butterscotch
3-Hydroxy-2-butanone	1–10	Fruity, moldy, woody
2,3-Butanediol	50–150	Rubber, sweet
2,3-Pentanedione	0.01–0.15	Butterscotch, fruity
<b>Sulfur compounds</b>		
Hydrogen sulfide	1–20*	Sulfidic, rotten eggs
Sulfur dioxide	200–20,000*	Sulfidic, burnt match
Carbon disulfide	0.01–0.3	Rotten eggs
Methanethiol	0.2–15	Putrefied
Ethylene sulfide	0.3–2.0	—
Ethanethiol	0–20	Putrefied
Propanethiol	0.1–0.2	Putrefied, rubber
Dimethyl sulfide	10–100	Cooked corn, canned tomatoes
Diethyl sulfide	0.1–1.0	Cooked vegetables
Dimethyl disulfide	0.1–3.0	Rotten vegetables
Diethyl disulfide	0–0.01	Garlic, burnt rubber
Dimethyl trisulfide	0.01–0.8	Rotten vegetables, onion
Methyl thioacetate	5–20	Cabbage
Ethyl thioacetate	0–2	Cabbage
Methionol	50–1300	Raw potatoes
Methional	20–50	Mashed potatoes, soup-like
3-Methyl-2-butene-1-thiol	0.001–0.1	Skunky, catty, lightstruck

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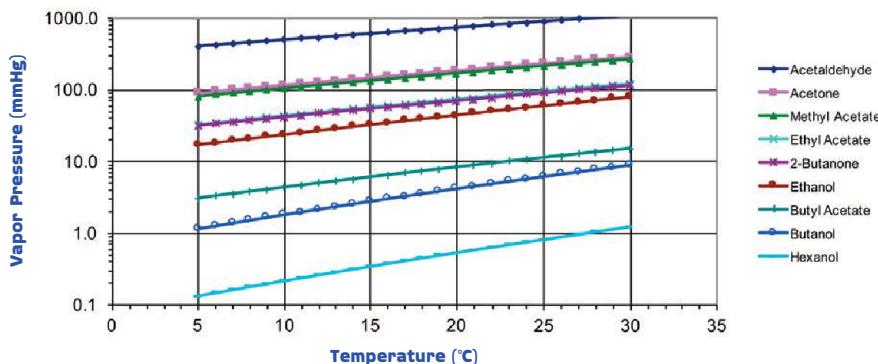
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**Figure 2:**  
**Effect of Temperature on Vapor Pressure of Aroma Compounds in Beer**



## Effect of Temperature on Specific Aroma Compounds in Beer

Researchers Hrvíčák, Šmogrovičová, Lakatošová, and Nádasky have investigated several of the compounds found within the vapor-phase headspace over beer.<sup>6</sup> The effect of temperature on the vapor pressure for nine of these compounds is illustrated in Figure 2.

Figure 2 shows that the vapor pressure, and therefore concentration in the vapor phase, increases significantly as temperature increases. The effect of temperature on the higher alcohol compounds butanol and hexanol is especially large. The vapor pressure of these compounds increases by 200 to 300 percent over a temperature range of 5 to 20° C.

Table 2 shows the percent increase in vapor pressure as the temperature of these compounds is increased from 5° C to 10°, 15°, and 20° C.

## Practical Sensory Implications

A slight increase in a beer's serving temperature can cause a dramatic increase in tasters' perception of aroma compounds, both good and bad. Therefore, it is important to serve beer at a temperature that is ideal for its style: a temperature range of 48 to 52° F (9 to 11° C) is generally considered ideal for most lagers, wheat beers, and lambics, while a slightly warmer temperature range of 50 to 60° F (10 to 15.6° C) is ideal for most other ales.

The cooler serving temperature range for lagers is appropriate for supporting the typically "clean" taste and aroma profile that is desirable in those styles; a cooler temperature means less overall taste and aroma intensity. Conversely, the higher ideal serving temperature for ales is appropriate because an elevated temperature enhances perception of a complex taste and aroma profile and produces an overall flavor intensity that is generally desirable in ales.

**Table 2:**  
**Vapor Pressure Percent Increase with Increasing Temperature**

Aroma Compound	Temperature (°C)				Vapor Pressure % Increase		
	5	10	15	20	5 to 10°C	5 to 15°C	5 to 20°C
Acetaldehyde	412	506	617	748	23%	50%	82%
Acetone	90.8	116	148	185	28%	63%	104%
Methyl Acetate	81.9	106	136	172	29%	66%	110%
Ethyl Acetate	32.8	43.5	57.0	73.8	33%	74%	125%
2-Butanone	32.1	42.3	55.1	70.9	32%	72%	121%
Ethanol	17.2	24.0	32.9	44.6	39%	91%	159%
Butyl Acetate	3.14	4.44	6.18	8.47	41%	97%	170%
Butanol	1.16	1.82	2.79	4.19	57%	141%	263%
Hexanol	0.13	0.22	0.35	0.54	63%	159%	302%

Numbers in table are vapor pressure in mmHg

If you are a beer judge and you are trying to detect the presence or absence of certain aroma compounds in beer, allow some time during the judging process to let the beer warm to a temperature that is higher than its ideal serving temperature. This allows the beer to "open up" and encourages aroma compounds that may only be present in low concentrations to volatilize and perhaps be more easily detected. If you have brewed a beer that has some noticeable flavor flaws, serve the beer at a colder temperature in order to minimize the overall perception of the flaws.

Finally, brew your beer in a way that ensures it contains as many desirable flavor compounds, and as few undesirable flavor compounds as possible. Having appropriate flavor compounds present in appropriate concentrations is key to having delicious beer at any temperature.

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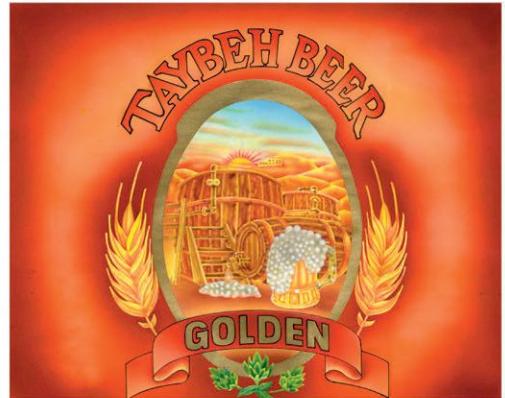
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# The BREW

Madees Khoury





# STER of the MIDDLE EAST

**F**ew people are likely to associate Palestine with a craft brewery, a female brewer, or an Oktoberfest that draws 16,000 guests. But that's exactly what you'll find in Taybeh, a town of 1,500 located 13 miles northeast of Jerusalem.

My family opened Taybeh Brewing Company, Palestine's first microbrewery, in 1993 after the Oslo Agreement. Brewing in Palestine comes with difficulties not frequently encountered elsewhere in the world, but as I grew to love the family business as a child, I knew I wanted to become the first female brewer in Palestine.

## A Family Business

I was born in Boston and spent most of my childhood in the United States. Although

By Madees Khoury

annual summer trips to Palestine offered chances to reconnect with family, my grandfather encouraged my uncle and father to return to Palestine and raise his grandchildren in our hometown of Taybeh, Ramallah, according to our roots and traditions. So when I was 10, we moved to Palestine, and my family started a brewery in the West Bank. I tried to spend time at the brewery every day, helping out or just running around, making noise, and watching my father, uncle, and grandfather work.

In 2003, I finished high school in the West Bank and decided I wanted to follow in my father's footsteps as a brewer. I returned to Boston to study Business

Management and Leadership at Hellenic College, and I was fortunate to get an internship at Harpoon Brewery. During my semester at Harpoon, I shadowed professionals in almost every department and learned as much as I could about brewing and packaging.

After I earned my degree in 2007, I was the first in my generation to pack my bags and buy a one-way ticket to Palestine, where I wanted to work with my family and contribute to our business. While working and learning the business, I also obtained my MBA at Birzeit University in Palestine. The multifaceted nature of brewing encouraged me to attend a brewing and packaging course in China, as well as visit breweries in the States, Europe, and Asia. It is inspiring to meet other passionate brewers from all around the world and to connect with them over beer.

## International Flavor

At present, we brew five different types of beer at Taybeh Brewing Company. Our flagship beer, Taybeh Golden, is a Pilsner-style beer of 5 percent ABV. We also brew Taybeh Dark, a 6-percent-ABV stout, and Taybeh Amber, which has a unique taste and is 5.5 percent ABV. In 2014 we introduced a Belgian-style wheat beer made with local wheat, orange, and spices, with 3.8 percent ABV. Finally, Taybeh Non-Alcoholic Beer is perfect for those who want to enjoy a refreshing beverage without the alcohol, including teenagers, pregnant women, drivers, and health-conscious individuals interested in the many benefits of beer.



Our styles are brewed in accordance with the Reinheitsgebot, using malts from Belgium and France, hops from the Czech Republic and Bavaria, yeast from England, and local spring water. We plan to introduce an IPA in the coming months, and soon, we hope to start a barrel program and begin experimenting with barrel-aged and sour beers. We currently export Taybeh Beer to Japan, Denmark, Sweden, Switzerland, Italy, Belgium, Germany and, quite soon, the United States.

Before Taybeh Beer, Palestinians were accustomed to drinking mass-produced beer, most of it from Israel, under the impression that Israeli products were superior. As the first microbrewery in the Middle East, it has been a challenge to educate Palestinian consumers on the qualities of handcrafted, fresh beer. Our beer is sold in major cities in Palestine, and Taybeh Non-Alcoholic has helped us enter areas where alcohol is culturally and socially unacceptable. But despite our hard work and time investment, the market in Palestine remains limited.

### Unusual Challenges

Doing business in Palestine means facing challenges that are somewhat unique compared to what most other breweries might encounter. Having no control over borders and water resources and lacking freedom of movement makes doing business difficult, costly, time-consuming, and frustrating.

It typically takes just two hours to drive from our brewery near Ramallah to the Israeli port. But our beer needs three days to get there because of the security measures it must pass through to enter Israel. It costs twice as much to send a shipment from our brewery to the port as it does to send that same shipment onward from the port to Tokyo. The Gaza strip has been unreachable since the Second Intifada (uprising) in 2000 after being blockaded by Israel, which means it is easier to send our beer to Europe than to ship it 65 miles away to Gaza!

Another major issue we face is limited water access. We only have running water

from a nearby spring once every 14 to 17 days in the summer, which limits the brewery's production and capacity. But despite the difficulties, my family is determined to do business and succeed. We currently produce 6,000 hectoliters of beer (5,113 U.S. barrels) annually, 50 percent of which is sold in Palestine. Thirty-seven percent is sold in Israel, and 13 percent is exported abroad.

In hopes of portraying a different image of Palestine, our brewery organizes the Taybeh Oktoberfest each year. Taking place this year on September 24 and 25, it has become the largest event in Palestine. The festival aims to promote our town of Taybeh, to grow the beer culture in Palestine, and to showcase our love for life. Since 2005, Taybeh Oktoberfest has grown to receive international and local attention and attracts visitors from all over the world.

Taybeh Oktoberfest is our way of peaceful resistance, as it is also an event to show the international world that we Palestinians are normal human beings who enjoy life, drink high quality craft beer, and listen to Palestinian music (hip-hop, rap, rock, reggae, and traditional). It is held every year to bring people together to celebrate with a glass of Taybeh Beer, regardless of religion, ethnicity, background, or nationality.

### Breaking Barriers

As a young brewer, I did and still do face challenges, not because of what I do, but because of who I am—a young woman doing work that many assume is only performed by men. It's a challenge to be taken seriously in what many characterize as "a man's world" or "a man's profession," despite my having more than a decade of experience in the beer business.

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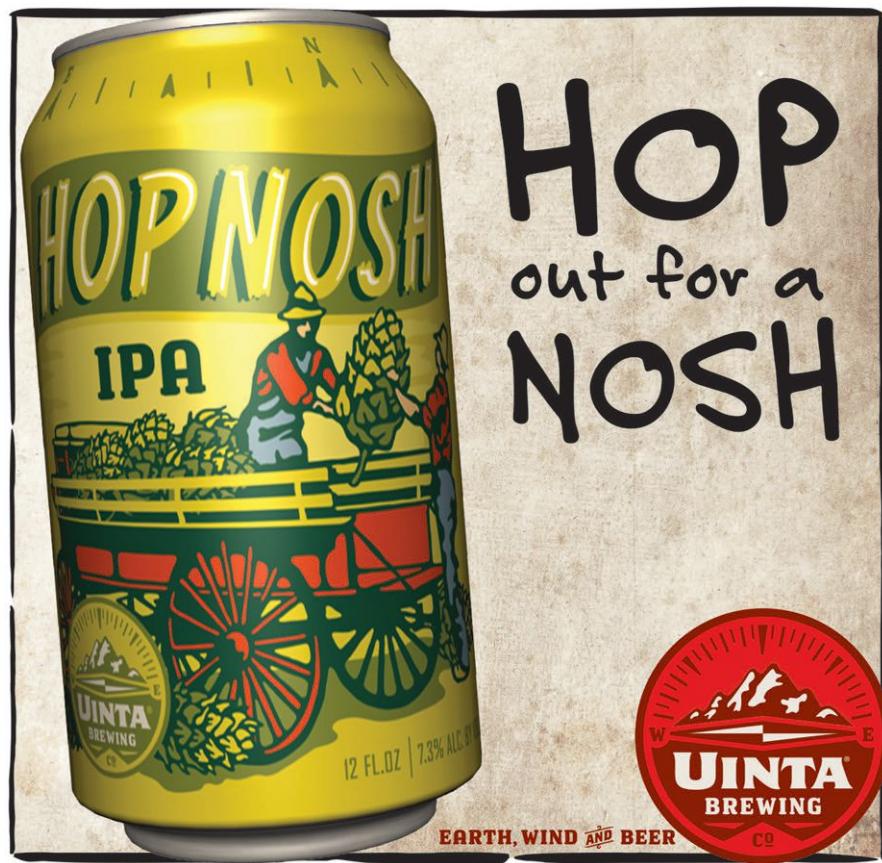
Most people would rather do business with my father and uncle—Palestinian culture is still mainly patriarchal despite the fact that the first brewers in history were women. Even if women are strong and independent in our society, there are men who only see us as housewives and expect nothing more. It's frustrating and backward thinking; women always have to prove themselves.

This is not a Palestine-specific phenomenon: other female brewers around the world are entering the industry and facing the same challenges I have. But over the past ten years, I have noticed things improving. Millennials, in particular, are starting businesses and would rather deal with me than with my uncle or father. I hope women continue to join our industry, and I believe the women of craft beer should be celebrated.

Despite the challenges, I have no intention of leaving Taybeh. I plan to continue brewing high-quality beer, distributing it locally, and entering international markets. I would like to expand the variety of beers we produce and include different flavors and seasonal beers to please and educate Palestinian people on different tastes and styles.

I have discovered and been exposed to many new things while working at the brewery, whether it's learning to brew or how to run a business in Palestine. I have been able to meet many people from different countries with diverse experiences and backgrounds, and I have expanded my social and beer network. It is a daily struggle for Palestinian businesses to succeed, but I have high hopes to accomplish Taybeh's future plans of expansion locally and globally. It is a fulfilling feeling to do what I enjoy and love—brewing beer—and to be able to offer that to other beer lovers.

**Madees Khoury is the only female brewer in Palestine and is widely recognized as the first modern-day female brewer in the Middle East. She can be reached at [madees.khoury@gmail.com](mailto:madees.khoury@gmail.com). For more information about the brewery or winery please visit [taybehbeer.com](http://taybehbeer.com) and [taybehwinery.com](http://taybehwinery.com), or follow Taybeh Beer on Facebook.**



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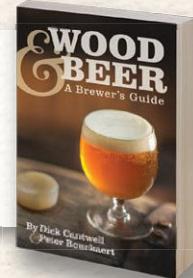
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# **FROM TOAST TO TERRAOR**



**Editor's Note:**

The following is adapted from Chapter 5 of *Wood & Beer: A Brewer's Guide* by Dick Cantwell and Peter Bouckaert, available now from Brewers Publications. Content has been substantially abridged and lightly edited to fit within the space available.



# How Wood Transforms Beer

By Dick Cantwell and Peter Bouckaert

**It's easy to get started with wood, simply by getting your hands on a barrel, filling it with beer, tasting it from time to time, and deciding when it's ready either to drink as is or to be blended off with something else. Or so one hopes.**

**O**r you can take it a step, or two, or six, further by weighing all the variables and making choices. What wood is it made from? Is it French, American, or from someplace else? Who made it? When? What degree of toast did it receive in the cooperage? Was it charred? What was in it prior to your acquisition? That's a lot of questions to be asking, and a lot of information to be gained, without even really knocking yourself out.

It can be daunting, as a beginner, simply to look at the various options available from supply houses for staves you can use to flavor beer in tanks—never even mind actual barrels yet. American? French? Limousin, or perhaps Vosges? Light, medium, or heavy toast? Size and shape? Grooved staves, thickness of the staves? To say you're feeling your way

as you get started is an understatement. What you're doing is guessing, going with your gut, and probably being bolder than absolutely required. You didn't get where you are by being cautious, right? No light toast for you. Heavy, heavy all the way. Anything worth doing is worth doing boldly.

And many of the barrel-aged beers in the infancy of modern rediscovery—say, 15 or so years ago—showed this kind of heavy-handedness. Naturally, it isn't quite that simple. You can get nice flavors from some staves, or barrels, subjected to heavy toast, but there's a lot to be gained from learning the differences. And that's only one variable. But it isn't a bad place to start. For now let's use toast as an introduction to the kinds of things one can weigh when deciding how to treat a wood- or barrel-aged beer.

## Toast

One could do worse than beginning with a look at the website of the French cooperage Nadalie and seeing what words they use to describe the differences in toast levels. According to them, light toast “brings fruit aromas to the wood.” Well, that's a start, isn't it? That's something you can get your head around. Subtle, pleasant, aspirant, appropriate for some beers, but maybe not for others.

Medium toast comes in two degrees, regular and plus, with the gradations of description you'd expect. “Fruit is dominant; very intense aromatic complexity,” runs medium regular—so far so good, a stronger variation on light, I'd say—while medium plus is, well, bolder: “Fruit mellows with empyreumatic flavors.” Oh boy. Already you're getting the idea that more toast doesn't just

turn up the volume on qualities earlier expressed. It can change things.

And what about that “empyreumatic?” There’s a word that leaves Dictionary.com in the dust, but a little more digging and Webster gives us “being or having an odor of burnt organic matter as a result of decomposition at high temperatures.” You could get into this, right? Not so hard if you can just keep your wits about you. From there, heavy toast is practically a layup: “Spicy, grilled aromas predominate.” Well, duh.

Look at the words and flavors described. Fruit, aroma, intense, complexity, burnt, spicy, grilled. Already a vocabulary presents itself. Already you’re getting the idea that degree of toast carries a spectrum that isn’t just a cumulative progression. There’s a metamorphosis along the way. And this is just toast.

Recall other words that are often used to describe oakiness, raw to incinerated. Remember vanilla? Remember coconut? Does butterscotch ring a bell? Clove? Smoke? There’s a lot to be perceived and discussed, just in plain English, or the plain version of whatever other languages people speak who are getting into aging beer in barrels these days. And there are other woods, as well, though it turns out there aren’t as many viable options as one might think.

We don’t want to alarm you, but each of these descriptors can be attributed to specific chemical compounds, which have names and other properties beyond simply giving flavor to beer and other alcoholic beverages (we can’t forget our vinous and spirituous brothers and sisters). The way they interact with wood can teach us how



different combinations of wood, water, alcohol, and other materials such as fruit behave over the course of time, also based on what processes have been enacted prior to and during this period of contact.

Add that to the fact that it’s highly likely the barrels we put beer into for aging have already enjoyed a relationship with either wine or spirits. In short, there’s a lot to think about if you choose to learn what’s really going on inside that barrel. And once you’ve begun to think about all that there’s really no turning back. You can’t unring a bell.

While there are several dozen flavor compounds that can be picked out of oak by analysis—typically gas chromatography and mass spectrometry—five basic groups contribute the flavors we most commonly associate with oak as they show up in beverages. In sensory analysis they become evident, by definition, because they exceed thresholds.

Vanillin is perhaps the most obvious one, and its name suggests the flavor it produces: vanilla. Lactones, such as cis-oak-lactone and trans-oak-lactone, provide the coconut flavor that, along with vanilla, can dominate a heavily oaked bourbon barrel stout or porter. Chromatographic analysis, in fact, reads lactone from oak

the same way it does from actual coconut; they are literally the same compound.

More controversial, given our brewerly training of avoidance where flavors of caramel or butter are concerned, are the furfurals (furfural and 5-methyl-furfural). These flavors have been a matter of fashion, prized in Chardonnays, for example, as the California wine industry was taking flight in the 1970s and 80s, but generally frowned upon in beer because of association with diacetyl. A marker of poorly managed fermentation, as well as simply a flavor characteristic of particular yeasts (a couple of classic English ones come to mind), diacetyl in evidence is one of the fastest ways to get a beer eliminated from competition.

More prolonged toasting will bring out the clove and spice flavors and aromas of eugenol and isoeugenol, dominant when one walks through a cooperage while barrels are being toasted. And then, most obviously, when barrels have been charred for use with bourbon, guaiacol and 4-methylguaiacol emerge to create a smoky and charred effect beyond that of actual burning wood. These are the main building blocks of the myriad structures constituting the beers, wines, and spirits that come into contact with oak, and, to some extent, other woods.

## Terroir

The origin of the wood and the very physiology of the individual tree also contribute to the intensity and the balance of all of these characteristics.

Individual cooperages, and, for that matter, coopers, will produce barrels from the same wood with different flavor and aromatic interplay, much the way different brewers can work with precisely the same ingredients—even from the same recipe—and produce markedly different beers. Throw in climate and the patterns of growing seasons over time and throughout the world, and the list of variables inherent in wood and the beers it can engender defies numbering. But we still have to try, not so much to count but to appreciate the choices made in the course of aging in barrels and the blending of contents that often comes later.

Long bandied in wine circles, the concept of *terroir* has over time penetrated other realms of agricultural production. Simply put, it is the contribution of the growing environment and conditions (such as soil conditions and climate) to the ultimate character and quality of a particular crop and the products to which it contributes. Wine has its grapes, beer its barley and hops, and spirits its various fermentables ultimately destined for distilling.

Oak as well can be thought to be the result of its terroir, the climate of its forests, the minerals of the soil in which it is grown, the rainfall it receives, and the readiness of its surrounding soil to retain moisture. While there exist a number of oak species used for making barrels, variations in character can be traced to individual regions of growth and even vary from tree to tree within a single forest, within a single species. The changes can vary minutely in the factors enumerated above, but also depend on such things as the straightness of the tree, its height, the consistency of its grain, and the placement of its branches.

Tightness of grain is probably the most highly prized characteristic where suitability of wood, and of oak in particular, is concerned. It's a measurement of the thickness and density of the yearly growth

rings in the wood, of how fast the tree is growing, pursuant to how well the soil in which the tree is growing retains moisture.

One aspect oak has over most other woods is that it is ring porous. This means that each year two distinct growth bands are generated, an early porous layer containing the sap-carrying vessels followed by a tighter, denser band later in the growing season. This later band can vary in size depending on circumstances within the growing year, while the ear-

lier growth tends to be fairly consistent. Depending on growth tendency, the sap-carrying rings can collectively comprise anywhere from five to 50 percent of the aggregate wood. Not surprisingly, this porous ring is where the greatest extraction into beer, wine, or spirits occurs.

## Seasoning, Bending, Toasting, and Charring

Once the tree has been split into staves, its first transformational step toward becoming a barrel ready for use is the

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Suggested usage rates can be as much as 20% of the grain bill without overpowering many styles of beer. Don't be afraid to experiment – it's at home in both ales and lagers! Try 1-5% for depth in Pilsner, Oktoberfest and Bock; 6-10% for complexity in malt-forward beers; and up to 20% for intriguing softness and a slight rye-like character. Expect pale gold to dark copper hues.

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degradation of tannins wrought by mold, mildew, and other microorganisms in the long course of time in the cooperage drying yard. This is a process not to be underestimated. If it didn't make a difference, years would not be devoted to it—up to seven or eight in the case of some of the large staves destined for feeders.

The methods by which the staves are prepared for bending can have an effect on the flavor of the wood. This involves the application of heat to render the wood

more pliable and varies by cooperage, with some proprietary methods. It can be administered by passage through a steam tunnel, by immersion in hot water, or by heating above a fire with water applied to keep the staves from catching fire. Each treatment has its effect on flavor, with immersion favoring vanillin and the fire method used for bourbon barrels providing more oak lactones.

While these earlier processes have bearing on flavors and aromas later to be

imparted by the oak of barrels, there is no doubt that toasting is the most important and distinguishing step in determining flavors and their balance. The descriptive words applied to levels of toast are traditional terms based on the visual appearance of the inside face of the staves. Light toast is a slight darkening of the inside wood, while heavy signifies dark to chocolate brown, but without char. Medium is supposed to be the color of toasted bread. Obviously some subjectivity is inherent in this interpretation and house standards vary from cooperage to cooperage.

The scale of light, medium, and heavy is really only a color-coding system indicating further changes going on in the wood. Another obvious clue to the chemical transformations being enacted is the smell of the wood as it is undergoing toasting. Results can be quantified and more closely standardized through the use of infrared sensors, applied either from time to time or throughout the toasting process.

### **What Happens When Beer Contacts Wood?**

Presume now that beer has been introduced to barrels made from wood properly seasoned, bent, and toasted or charred to a desired degree. Oak is the main wood used for all of this, but in the case of fermentation one can encounter such woods as cedar, fir, pine, larch, and even cypress or other regionally exotic woods, though this is more often found in the spirits industry. These vessels are also more commonly lined, with pitch or other material, and would therefore contribute no flavor either from wood or the lining material. We shall therefore concentrate more on the effects of prolonged aging in wood. Keep in mind that it is relatively rare for brewers to use barrels for aging fresh from the cooper's shop, so subsequent use will show diminished effect from the wood itself. It will, in many cases, still be evident, however.

The most obvious of these effects is extraction of flavor from the wood. This includes all of the compounds treated above in the discussion of toasting and its effects, but also of charring, and of the residual flavor

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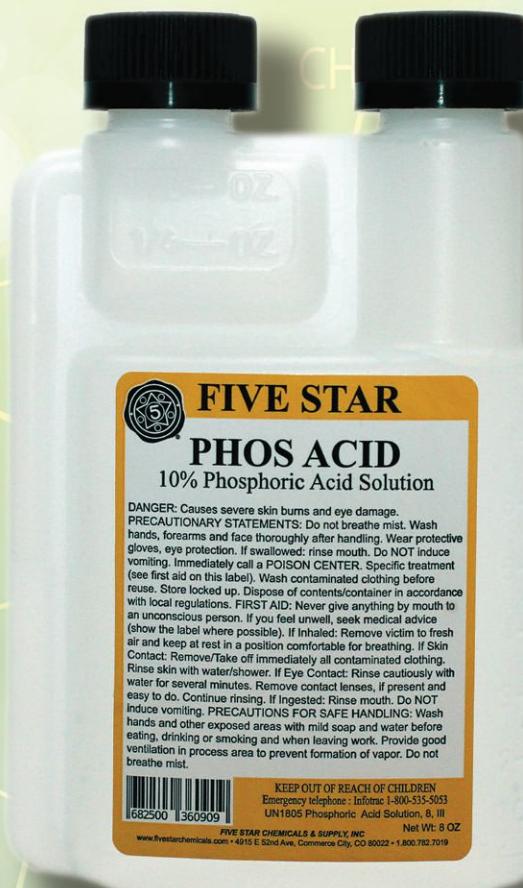
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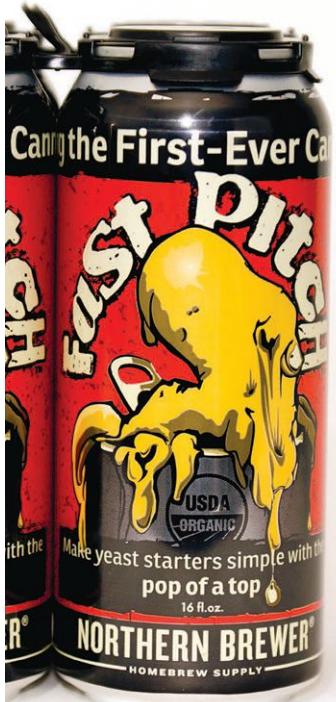
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effect of whatever other liquid—beer, wine, or spirit—resided in the barrel prior to the fill in question. It is this latter effect, of previous contents—and bourbon, in particular—that first attracted many modern brewers to barrel aging. This extraction can be substantial, even setting aside spirits barrels that arrive audibly awash in residual previous contents.

Looking at the makeup of a stave in contact with liquid, three main zones present themselves from inside to outside. The inner “waterlogged” zone comprises 1 to 3 millimeters, which will be stained by previous contents such as red wine. Its thickness is dependent on time and conditions of storage. The next, fiber-saturated zone has a moisture content of around 18 percent, but is without free water, hampering the flow outward of larger molecules. Then there is the progressive drying zone on the outer layer of the barrel, holding 8 to 12 percent moisture and maintaining equilibrium with the outside humidity by possible passage of water molecules, either way depending on conditions.

Temperature and humidity can affect extraction. Cool and somewhat humid is best, in order to minimize the rate of evaporation of water and alcohol, or the “angel’s share,” lost to the cellar through the wood. The breaking point is roughly 65 percent humidity, with water evaporation occurring below and ethanol evaporation occurring above. Even a tightly closed barrel can give up 2 to 5 percent per year of its contents, and can create an interior vacuum as water and/or alcohol is pulled from the wood.

Further, pressure can push contents one way or the other, depending on whether the barrel is over- or under-pressurized relative to its surroundings. High temperature also extracts more character from the wood in general. Fluctuation in temperature results in greater extraction due to the repeated ebb and flow of a barrel’s contents into and out of the wood. Higher levels of ethanol can also increase the flow of liquid and level of extraction. Both water and ethanol are wood-extractive solvents. They just behave differently under different conditions.



Type, condition and treatment of wood have probably the most dramatic effect on flavor extraction. We've seen the influence of toasting where this is concerned, as well as the physiological differences and sensory manifestations inherent in woods from different growing regions. Once again, tighter grain results in a higher proportion of porous early wood, and, hence, greater extraction. Other heat treatments associated with bending can favor Maillard reaction and its resultant flavors.

Some wood-aged beers never see the inside of a barrel. Instead, they are infused by various methods using staves, chunks, spirals, cubes, diamonds, and chips, and even powders (use caution, as inhalation can trigger allergies), generally of oak but sometimes of other woods. In most cases these other products have been subjected to toasting, and so carry the characteristics of degree along with the simple infusion effect of the wood.

And then there is yeast, a factor far more critical for aging beer than wine, and one entirely absent in spirits. With lower alcohol content and the presence of nutrients such as free amino acids, our friend *Saccharomyces* is very comfortable reducing away in the medium of beer, with *Brettanomyces*, if present, choosing either to reduce or oxidize.

Many extractive effects could be attributed to simple contact between liquid and wood,

the leaching of flavor and other properties in an essentially passive way. It should come as no surprise, given the myriad thermal, chemical, biological, and temporal considerations we've given other processes leading up to the manufacture and filling of barrels, to find that the reductive (from charred layer in bourbon barrels), reactive, and otherwise transformational steps onward do not cease once the filled barrel is lovingly patted and laid to indeterminate rest.

Oak tannins (mainly elagitannins) have a very low capacity for oxygen reduction (redox), which demands, since such things must act in balance, that other factors in the liquid act to consume oxygen-freeing peroxide and acetaldehyde. Oxygen is, of course, also reacting with settled materials such as trub, yeast, and other lees and microorganisms. In addition, enzymatic reactions can both oxidize and reduce inhibitors. Beyond the apparently easy balance of some of these oxidative processes, too much oxygen entering the barrel can lead to the formation of acetic acid, due to the presence of sufficient airborne acetobacter. Likely more than simply permeating the wood, oxygen could enter via the bung, in between staves above the level of liquid, or around the head.

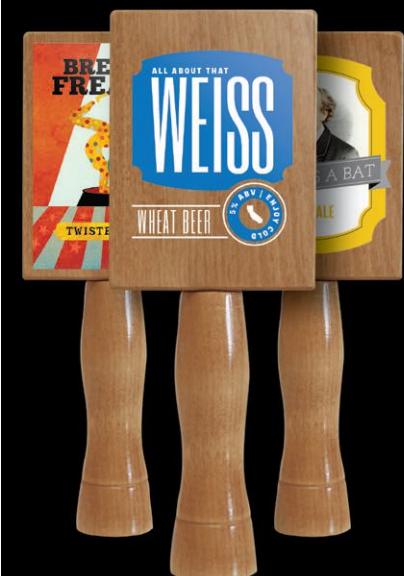
This mention of a souring effect generally considered undesirable begs the discussion of sour effects in wood-aged beer sought and desired. Oxygen is an essential part of these processes, as are time and the microorganisms present—perhaps in solution, but, more to the point, resident in the wood in question. The practice of kettle souring with *lactobacillus*, so popular among craft brewers these days, is essentially separate from this, but if the wort is not boiled prior to initial fermentation these bacilli could certainly come into play.

Cellars of between 14.5° C and 16.5° C provide an ideal range of temperature for bacteria otherwise regarded as “beer spoilers” to work, nibbling away further at residual nutrients ripe for oxygen-related microbiological degradation. Once again, the key to this introduction of oxygen is that it be slow, a result of the barrel constituting an essential barrier between contents and the outside



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atmosphere, in order to create an environment where facultative aerobic and anaerobic organisms can thrive. *Brettanomyces* can function either way. Microorganisms that have been hampered along the way by lack of nutrients or unfriendly extremes of alcohol or pH can still lie dormant in wood for later awakening.

\*\*\*\*\*

Whether verbal, sensory, biological, or chemical, it's doubtful how much of all this analysis crossed the minds of early makers of barrels, even when they began storing alcoholic beverages within them. Barrels just seemed like a good idea at the time, and filling them with wine, beer, and spirits was merely an efficient way to set volumes of liquid aside for a while. With time, however, notice was taken and processes devised that made positive use of the effects of wood. Understanding these processes and having a grasp of the quantification of all these effects are what help us begin to control their influence on beer.

**Dick Cantwell** co-founded Elysian Brewing Company in 1996, where he served as head brewer until its sale to Anheuser-Busch in 2015. During his tenure, Elysian was named Large Brewpub of the Year three times at the Great American Beer Festival® (1999, 2003, and 2004). He is co-author of *Barley Wine* with Fal Allen and is author of *The Brewers Association's Guide to Starting Your Own Brewery*, both available from Brewers Publications. Dick currently serves as the Brewers Association's Quality Ambassador.

**Peter Bouckaert** is brewmaster at New Belgium Brewing Company. Prior to joining New Belgium, he brewed for a decade at Brewery Rodenbach in Roeselare, Belgium. He was an early advocate of brewing hoppier beers outside the Belgian tradition, exploring IPAs, Czech-style lagers, fruits, spices, wood-aging and fermentation, and experimenting with yeast and microbe strains from around the world. Peter's mantle includes awards from World Beer Cup™ and the Great American Beer Festival and a handful of other beer accolades. ☘

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By Amahl Turczyn

# Shamrock Open

The 21st annual Shamrock Open was held March 5th at the North Hills Country Club in Raleigh, North Carolina. Members of homebrew club CARBOY (Cary, Apex, Raleigh Brewers of Yore) have organized the competition since the club's inception in 1995.

The Shamrock Open is one of the largest competitions in the state, which according to club member Gary Morgan, meant limiting entries to fewer than 400 this year. Participants on hand to handle the large event included 107 brewers, 48 judges, and 24 stewards. Flights for judges were kept to reasonable numbers so that the club could emphasize its priority goal: quality feedback for entrants. The North Hills Country Club offered an excellent judging environment, with the banquet room providing good lighting, lots of space, and few distractions.

"The Shamrock Open has for years been known for its massive raffle," noted Morgan, "and this year was no exception." In order to attract quality judges, CARBOY began offering rare beers (at least rare to North Carolina) as special door prizes for participating judges, a move that elicited much positive feedback. But special beers weren't the only prizes: best of show (BOS) winner Russell Burnitt received a BeerBox set from Brewing Tools for his award.

For the third year straight, a Flanders-style red ale has won the competition's best of show award. But while the winning style has remained constant, each of the three years has seen a different brewer take home the BOS honor. "We can't say that competition judges have a preference for sour beers," shrugged Morgan, "because the best-of-show judges are different each year."



Rare beers were offered as door prizes for judges. (top)  
Beer judging in action. (bottom)

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**"I INHERITED MY LOVE  
OF BREWING BEER  
BY WATCHING MY  
FATHER BREW AS I  
WAS GROWING UP."**

— Russell Burnitt

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One thing is certain, however—Burnitt learned his craft the hard way. Like many successful brewers, his educational foundation in science has helped his brewing methodology, but beer also runs in the family. "I inherited my love of brewing

beer by watching my father brew as I was growing up," he said. "I began to experiment with extract brewing in 1993 while living in San Jose, California and then advanced to all-grain. Having an engineering background, I really enjoy the process and the precision that can be applied to achieve the end product."

Years later, Burnitt engineered the perfect brew system for his passion. "After relocating to North Carolina, and with a nudge from my wife Kimberly, I built my dream system in the basement: a 10-gallon, all-grain, electric HERMS," he continued. "I joined a local brew club, Iredell Brewers United (IBU), and in 2014 my friends suggested I enter a competition."

## Flanders Red

Russell Burnitt et al. (see text)

### INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

<b>4.5 lb.</b>	(2.04 kg) Pilsner malt (38%)
<b>4 lb.</b>	(1.81 kg) Vienna malt (34%)
<b>1 lb.</b>	(0.45 kg) Munich malt (8%)
<b>7 oz.</b>	(198 g) Aromatic malt (4%)
<b>7 oz.</b>	(198 g) Special B malt (4%)
<b>7 oz.</b>	(198 g) Flaked oats (4%)
<b>7 oz.</b>	(198 g) White wheat malt (4%)
<b>7 oz.</b>	(198 g) 20° L crystal malt (4%)
<b>1 oz.</b>	(28 g) East Kent Golding pellets, 5% a.a. (60 min)

East Coast Yeast ECY20 Bug County yeast

**Original Gravity:** 1.057

**Final Gravity:** 1.009

**IBUs:** 15

**SRM:** 12

**ABV:** 6.4%

**Brewhouse Efficiency:** 73%

**Boil time:** 90 minutes

### ALL-GRAIN RECIPE

Use a water profile similar to that of Antwerp. Mash for one hour at 155° F (68° C), lauter, sparge, and boil for 90 minutes. Ferment/age beer in a wine barrel for 24 months at 65° F (18° C).

### PARTIAL-MASH RECIPE

Reduce Vienna malt to 1.75 lb. (0.79 kg) and substitute 5 lb. (2.27 kg) Pilsner malt extract syrup for Pilsner malt. Mash Vienna malt with remaining grains for one hour at 155° F (68° C). Drain, rinse grains, and dissolve extract completely. Proceed with boil as above.



Raffle table at the Shamrock Open.

Once that seed was planted, the rest was history. “I won second place in my first contest, so I entered more. Since then I’ve had a good run and have placed in every contest I’ve entered. I love to brew and drink all styles and love to experiment. I’ve found that having good beer sure helps you have a lot more friends!”

Some of these friends were instrumental in Burnitt’s Shamrock Open BOS victory. Although Russell entered the beer

and deserves recognition for the award, he is the first to admit that several other brewers are also owed credit. “This beer was very much a team effort,” he explained, a beer brewed by a team “composed of a select set of brewers from several beer clubs.”

Those contributing brewers included Michael Thomas, Joe Domm, Matt Eisbrener, Wes Gibson, Shawn McBride, Chris Olden, Pinky Parsons, Steve Roles,

Daniel Schrock, and Luke Waterson. One member of the team is even going pro: Michael Thomas is in the process of opening a new brewery called 1789 Brewing Co. in Statesville, N.C.

The brewers worked hard to scale their project ale’s volume to a worthy, traditional vessel, waited patiently for the blend of yeasts and microflora to work its magic, then repeated the process, topping up the fermenter solera-style. “We each brewed enough to fill a 60-gallon wine barrel. This beer fermented for a year, and then we emptied half and refilled the barrel with another 30 gallons of the same recipe. So it’s been going for a total of two years,” Burnitt said.

Their labor was not in vain, as their best-of-show creation has found success in other competitions as well. “It also won second place in the National Homebrew Competition first round in Nashville and will go on to the final NHC round,” Burnitt reported.

Burnitt kindly provided his award-winning recipe to *Zymurgy*. It is printed here, scaled to a batch size of 5.5 gallons.

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

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## KUDOS—BEST OF SHOW

### AHA/BJCP Sanctioned Competition Program

#### August 2015

Colorado State Fair Homebrew Competition, 690 entries—Geoff Coleman, Fort Collins, CO

#### January 2016

Biere de Rock, 123 entries—Scott Pointon, Chicago, IL

The Local Brewers Cup, 76 entries—Joshua Bennett, Bellingham, WA

#### February 2016

The 11th Annual Peterson Air Force Base Homebrew Competition, 360 entries—Jan Kutej, Colorado Springs, CO

KLCC Microbrew Fest Homebrew Competition, 228 entries—Cecilia Bennet, Corvallis, OR

Homebrew Alley X, 491 entries—Matt Knott

War of the Worts XXI, 790 entries—Chris Mazzone

British Beerfest Competition, 177 entries—Richard Reed, Akron, OH

2016 GEBL IPA Bracket Challenge, 71 entries—Chris Hudson, Lynnwood, WA

23rd Annual Peach State Brew Off, 477 entries—Hamp Covington, Atlanta, GA

SFBC Sub Zero Homebrew Competition, 79 entries—Jon Spee, Kitchener, ON

#### March 2016

America's Finest City Homebrew Competition, 452 entries—Tim Wang, Carlsbad, CA

Concurso HomeBrew ACCE M16, 71 entries—Dioni De La Morena Morales, Madrid, Spain

BABBLE Brew Off, 256 entries—Bob Manke, Kansasville, WI

Lancaster Iron Brewer, 178 entries—Mark Witzel, Douglassville, PA

Fur Rendezvous Homebrew Competition, 39 entries—Willie Creamer, Anchorage, AK

Reinheits-Revolt Homebrew Contest, 36 entries—Jeremy Ahrens, WI

2016 Garrison Home Brew-Off, 41 entries—Mark Power, Halifax, NS

Lethbridge Werthogs 17th Annual WertContest, 200 entries—Jeremy Cowan, Calgary, AB

Shamrock Open XXI, 265 entries—Russell Burnitt, Mooresville, NC

Wan Cup, 183 entries—Yasunori Namioka, Nara, Japan

Bockfest, 43 entries—Gautam Bagchi, Columbus, OH

Rocket Rod's Kona Homebrew Contest, 137 entries—Bob Johnson, Emerald Hills, CA

Snake Saturday Irish-Only Competition, 24 entries—Kevin Thuringer, Olathe, KS

Enchanted Brewing Challenge 2016, 144 entries—Ben Hamilton

Tanunda Show, 102 entries—Matthew Wood, Adelaide, Australia

Bridging the Gap Homebrew Competition, 154 entries—Virgil Redman, Vacaville, CA

Jeff Sanders Memorial, 38 entries—Doug Brown, San Diego, CA

Daegu Brewers Stout Smackdown, 28 entries—Bum Ho Peter Kim, Busan, Korea

Scorpion Homebrew Competition, 37 entries—Michael Basso, Edgewood, MD

March Mashness, 162 entries—Chris Smith, Minneapolis, MN

ISB Summer Lovin' Homebrew Competition, 134 entries—Matt Foster, Sydney, Australia

26th Annual Hudson Valley Homebrewers Competition, 326 entries—Steve Medd, Danbury, CT

Márciusi sörforradalom, 220 entries—Merkli Norbert, Budapest, Hungary

Steins' Second Annual Home Brew Contest, 23 entries—Scott Wilson, Gilroy, CA

Bluebonnet Brew-Off XXX, 1,411 entries—Grant Chandler, Little Rock, AR

2016 Washington State Mead & Cider Cup, 60 entries—Brian Scott, Everett, WA

Drunk Monk Challenge, 713 entries—Timothy Elder, Kansas City, KS

Mountain View Homebrew Open, 266 entries—Jeremy Cowan, Calgary, AB

The Scots v. The Irish, 21 entries—Miles McLennan, San Diego, CA

6th Copa Cerveceros Caseros de Chile, 48 entries—Rodrigo Hess, Santiago, Chile

St Patrick's Day Homebrew Contest, 80 entries—Dan Sheridan, Winona, MN

Mazer Cup International Mead Competition, 450 entries—Mark Tanner, Oak Harbor, WA

VI Concurso Interno ACervA Paulista, 66 entries—Luis Fernando Briante Alonso, São Paulo, Brazil

WIZARD OF SAAZ 9, 357 entries—Paul Shick, Cleveland Heights, OH

SMASH 2016, 17 entries—Bryn Hansen

Bataille des Bieres, 46 entries—Tre Haydel



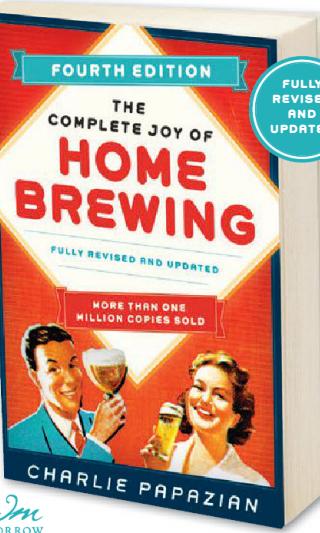
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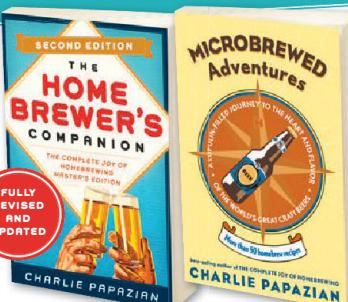
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## KUDOS—BEST OF SHOW

### AHA/BJCP Sanctioned Competition Program

South Yeaster's Summer Festival, 18 entries—  
Reuben Roberts, Cape Town, South Africa  
Suwanee Beer Festival Homebrewing Competition,  
300 entries—Robert Miller  
SNAFU Winterfest, 166 entries—Jason Coleman,  
Henderson, NV  
Athens Homebrew Classic, 65 entries—  
Alex MacIntosh, Providence, RI  
Quarterly Brewing Challenge by the Homebrew  
Emporium, 15 entries—Tyler McSorley, Watertown,  
MA  
Arizona Spring Classic Homebrew Competition,  
250 entries—Michael Fry, Vail, AZ  
DC Homebrewers Cherry Blossom Competition,  
234 entries—Michael Stuppy, Alexandria, VA  
2nd Annual Lager, Lager Everywhere, and  
Not an Ale to Drink, 44 entries—Jesse Young,  
Lynnwood, WA  
Charlie Orr Memorial Chicago Cup Challenge,  
437 entries—Jeff Landers, Hoffman Estates, IL

### April 2016

Amber Waves of Grain, 638 entries—Rob Sells,  
Fredonia, NY  
World Cup of Beer, 475 entries—Ben Mosher,  
Berkeley, CA  
Battle of the Brew, 36 entries—Jim Chapman,  
Weslaco, TX  
OC MashUps Big Beer Competition, 8 entries—  
Sean O'Shea, Costa Mesa, CA  
Lagerpalooza 2, 96 entries—Don Robinson,  
Salt Lake City, UT

Livingston County Social Brew Crew  
Homebrewing Competition, 8 entries—  
Paul Phipps, Howell, MI  
Beans and Brews, 23 entries—Jim Nesbitt,  
Elizabethtown, PA  
TRASH XXVI, 289 entries—Christopher Staub,  
Pittsburgh, PA  
Spirit of Free Beer Homebrew Competition,  
355 entries—Wendy Aaronson, Rockville, MD  
UNYHA 38th Annual, 259 entries—Rob Sells,  
Fredonia, NY  
Thirsty Orange, 205 entries—Thomas Creek,  
Greenville, SC  
Between the Bluffs Homebrew Competition,  
58 entries—Todd Rieck, La Crosse, WI  
Slurp & Burp Open, 280 entries—Mike Forbess,  
Portland, OR  
Ocean State Homebrew Competition,  
505 entries—Matt Border, Boston, MA  
Nebraska Shootout, 116 entries—Scott Strain,  
Omaha, NE  
Whiskey Row Homebrew Club, 4 entries—  
Chris Romo, Prescott, AZ  
Beer Quest Xperiment Ale, 20 entries—  
Brandt John, Lincoln, NE  
Helena Spring Homebrew Competition,  
17 entries—Jon Goff, Gransville, UT  
Bubbly Creek Barrel Brawl, 27 entries—  
Alfredo Diaz, Chicago, IL  
Belgian Beerfest, 57 entries—Paul Cook  
South Shore Brewoff 2016, 218 entries—  
Matthew Dirckx, Boston, MA

Lowcountry Showdown, 46 entries—Michael Kaup,  
Hilton Head Island, SC

VI Concurso ACerva Mineira de Cervejas  
Artesanais, 49 entries—Giovanni Mendes,  
Belo Horizonte, Brazil

Erie County Fair Home Brew Competition,  
151 entries—Mark Zambron, West Seneca, NY

COHO Spring Fling, 261 entries—Tim Koester,  
Bend, OR

Colonial Cup, 309 entries—Dennis Pike,  
Chapel Hill, NC

Philly Homebrew Cup, 108 entries—Mark Witzle

HKHA 4th Annual Homebrew Competition,  
124 entries—Alex Wong, Hong Kong

Kohler Festival of Beer Homebrew Competition,  
79 entries—Mike Fischer, Plymouth, WI

Mead Free or Die, 169 entries—Kaspersky Jerzy,  
Legnica, Poland

Boardtown Brew-Off, 133 entries—  
Jonathan Harden, Greenville, MI

Cactus Challenge, 332 entries—Kerry Martin,  
Austin, TX

Greg Noonan Memorial Homebrew Competition,  
252 entries—Aaron Ritchie, Williston, VT

### May 2016

Great Basin Brew-Off, 61 entries—Jeff Klino,  
Reno, NV

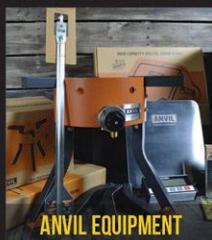


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**July 2**

**Brew Brighton: USA Edition**

Brighton, UK.

Entry Deadline: 6/10/2016

[mini-comp2.londonamateurbrewers.co.uk](http://mini-comp2.londonamateurbrewers.co.uk)

**July 2**

**Copa Cerveza Regia**

Monterrey, Nuevo Leon, Mexico.

Entry Deadline: 6/27/2016

[facebook.com/moterreyipa](http://facebook.com/moterreyipa)

**July 8**

**Indiana State Fair Brewers' Cup Competition**

Indianapolis, IN.

Entry Deadline: 6/24/2016

[indianabrewerscup.com](http://indianabrewerscup.com)

**July 9**

**Copper Hills Brewfest**

Yerington, NV.

Entry Deadline: 6/27/2016

[yeringtonbrewfest.org](http://yeringtonbrewfest.org)

**July 9**

**Amador County Fair Homebrew Competition**

Plymouth, CA.

Entry Deadline: 6/25/2016

[brewangels.com](http://brewangels.com)

**July 9**

**5th Annual Merrimack Valley Homebrew Competition**

Lowell, MA.

Entry Deadline: 6/25/2016

[mvhbc.com/competition](http://mvhbc.com/competition)

**July 9**

**Competencia Amateur Cerveza Mexico 2016**

Mexico City, Mexico.

Entry Deadline: 6/10/2016

[copacerveza.mx](http://copacerveza.mx)

**July 9**

**Hopkins Home Brew Competition**

Hopkins, MN.

Entry Deadline: 6/25/2016

[raspberrybeefest.com/Raspberry\\_beerfest\\_Brew\\_Contest.htm](http://raspberrybeefest.com/Raspberry_beerfest_Brew_Contest.htm)

**July 9**

**Antelope Valley Home Brew Competition**

Palmdale, CA.

Entry Deadline: 7/2/2016

[transplantbrewing.com](http://transplantbrewing.com)

**July 9**

**8th Annual All American Brew Off**

Fort Smith, AR.

Entry Deadline: 6/25/2016

[rivervalleyaleraisers.com](http://rivervalleyaleraisers.com)

**July 9**

**Homebrew Inquisition**

Austin, TX.

Entry Deadline: 7/9/2016

[inquisition.brewcomp.com](http://inquisition.brewcomp.com)

**July 10**

**War of 1812 Homebrew Competition**

Waterloo, ON, Canada.

Entry Deadline: 7/8/2016

[shortfingerbrewing.com/pages/warof1812](http://shortfingerbrewing.com/pages/warof1812)

**July 11**

**Lane County Fair**

Eugene, OR.

Entry Deadline: 7/11/2016

[atthefair.com/Exhibits-openshow](http://atthefair.com/Exhibits-openshow)

**July 14**

**El Paso County Fair Homebrew Competition**

Colorado Springs, CO.

Entry Deadline: 7/9/2016

[brewbroscopy.com/wordpress/competitions/el-paso-county-comp](http://brewbroscopy.com/wordpress/competitions/el-paso-county-comp)

**July 15**

**Boom Days Belgian-Style Homebrew Competition**

Minneapolis, MN.

Entry Deadline: 7/10/2016

[boomdayscomp.com](http://boomdayscomp.com)



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**July 16**

**Deer River BBQ & Brew Fest**

Deer River, MN.

Entry Deadline: 7/15/2016

[deeriver.org/events/event.php?number=116](http://deeriver.org/events/event.php?number=116)

**July 16**

**E.T. Barnette Homebrew Competition**

Fox, AK.

Entry Deadline: 7/13/2016

[mosquitobites.com/Den/Beer/Events/Events.html](http://mosquitobites.com/Den/Beer/Events/Events.html)

**July 16**

**Welsh National Homebrew Competition**

Cardiff, Wales, UK.

Entry Deadline: 6/30/2016

[homebrewcompetition.wales](http://homebrewcompetition.wales)

**July 16**

**2016 Ohio Brew Week Homebrew**

**Competition**

Athens, OH.

Entry Deadline: 7/1/2016

[obw.brewcomp.com](http://obw.brewcomp.com)

**July 16**

**3rd Annual Central California Craft Beer**

**Competition**

Tehachapi, CA.

Entry Deadline: 7/1/2016

[tehachapibrew.com](http://tehachapibrew.com)

**July 23**

**Gillette Main Street Brewfest**

Gillette, WY.

Entry Deadline: 7/23/2016

[gillettemainstreet.us](http://gillettemainstreet.us)

**July 23**

**For What It's Worth**

Bloomington, IL.

Entry Deadline: 7/8/2016

[forwhatitsworth.brewcomp.com](http://forwhatitsworth.brewcomp.com)

**July 23**

**Arvada On Tap**

Arvada, CO.

[visitarvada.org/events/arvada-on-tap/home-brew](http://visitarvada.org/events/arvada-on-tap/home-brew)

**July 23**

**Crystal Coast Brew Off**

New Bern, NC.

[athomebrewclub.com](http://athomebrewclub.com)

**July 30**

**Hail the Ale**

Manhattan, KS.

Entry Deadline: 7/15/2016

[rhythmandbrewsmhk.org](http://rhythmandbrewsmhk.org)

**July 30**

**2016 Michigan Beer Cup**

Auburn Hills, MI.

Entry Deadline: 7/9/2016

[michiganbeercup.com](http://michiganbeercup.com)

**July 30**

**2016 German Fest Stein Challenge**

West Allis, WI.

Entry Deadline: 7/18/2016

[steinchallenge.com](http://steinchallenge.com)

**July 30**

**3rd Annual MoM Hot Summer BrewOff**

North Kansas City, MO.

Entry Deadline: 7/16/2016

[momashers.talkhops.com](http://momashers.talkhops.com)

**July 30**

**First Coast Cup**

Jacksonville, FL.

Entry Deadline: 7/8/2016

[thecask.org/fcc.htm](http://thecask.org/fcc.htm)

**July 30**

**20th Annual New Jersey State Fair**

**Homebrew Competition 2016**

Augusta, NJ.

Entry Deadline: 7/16/2016

[scubabrewclub.com](http://scubabrewclub.com)

**July 30**

**Denver County Fair Liquid Libations**

**Competition**

Denver, CO.

Entry Deadline: 7/22/2016

[denvercountyfair.org](http://denvercountyfair.org)

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



**July 30**  
**Brew Haven**  
New Haven, IN.  
Entry Deadline: 7/23/2016  
[beercomp.triontavern.com](http://beercomp.triontavern.com)

**July 31**  
**Ventura County Fair**  
Ventura, CA.  
Entry Deadline: 7/30/2016

**August 6**  
**New South Brew Off**  
Clarksville, TN.  
Entry Deadline: 7/29/2016  
[clarksvillercarboys.com/blog/?page\\_id=566](http://clarksvillercarboys.com/blog/?page_id=566)

**August 6**  
**Best of the Bay Homebrew Competition**  
Bellingham, WA.  
Entry Deadline: 7/27/2016  
[bellinghambrewers.com/competitions](http://bellinghambrewers.com/competitions)

**August 7**  
**Western Idaho Fair**  
Garden City, ID.  
Entry Deadline: 7/31/2016  
[western.microbrewin.com](http://western.microbrewin.com)

**August 12**  
**Kentucky State Fair Homebrew Competition**  
Louisville, KY.  
Entry Deadline: 7/1/2016  
[kystatefair.org/index.html](http://kystatefair.org/index.html)

**August 13**  
**Manitowoc County Fair Beer Competition**  
Manitowoc, WI.  
Entry Deadline: 8/1/2016  
[manitowoccountyexpo.com](http://manitowoccountyexpo.com)

**August 13**  
**Malt Madness X**  
Hellertown, PA.  
Entry Deadline: 7/28/2016  
[lvhb.org](http://lvhb.org)

**August 13**  
**Oregon State Fair Homebrew Beer Competition**  
Salem, OR.  
Entry Deadline: 7/29/2016  
[oregonstatefair.org/competitions/home-brew](http://oregonstatefair.org/competitions/home-brew)

**August 13**  
**The Growler's North Mississippi Annual Home Brew Competition**  
Oxford, MS.  
Entry Deadline: 6/15/2016  
[thegrowleroxford.com](http://thegrowleroxford.com)

**August 14**  
**Montgomery County Agricultural Fair Homebrew Competition**  
Gaithersburg, MD.  
Entry Deadline: 7/30/2016  
[mcaf.brewcomp.com](http://mcaf.brewcomp.com)

**August 14**  
**Limbo Challenge**  
Carrollton, TX.  
Entry Deadline: 7/28/2016  
[limbocomp.org](http://limbocomp.org)

**August 16**  
**San Juan County Fair Homebrew Beer Competition**  
Friday Harbor, WA.  
Entry Deadline: 8/16/2016  
[sjcfair.org](http://sjcfair.org)

**August 17**  
**Women's Homebrew Competition**  
Toronto, ON, Canada.  
Entry Deadline: 8/3/2016

**August 20**  
**5th Annual Chili Pepper Extravaganza**  
Brighton, CO.  
Entry Deadline: 8/15/2016  
[reggiebeer.com/PepperExtravaganza.htm](http://reggiebeer.com/PepperExtravaganza.htm)

**August 20**  
**7th Annual Beehive Brew-Off**  
Salt Lake City, UT.  
Entry Deadline: 8/13/2016  
[beernut.com/beercomp](http://beernut.com/beercomp)

**August 20**  
**3rd Annual Macon Beer Festival Home Brew Competition**  
Macon, GA.  
Entry Deadline: 7/15/2016  
[themaconbeerfest.org](http://themaconbeerfest.org)

**August 20**  
**Beer and Sweat**  
Hebron, KY.  
Entry Deadline: 8/10/2016  
[beerandsweat.brewcomp.com](http://beerandsweat.brewcomp.com)

**August 27**  
**5º Concurso Cervejeiro Caseiro Bierland**  
Blumenau, Santa Catarina, Brazil.  
Entry Deadline: 4/9/2016  
[bierland.com.br/apresentacao.html](http://bierland.com.br/apresentacao.html)

**August 27**  
**I Concurso Homebrewer del festival "El Milanito"**  
Montemayor de Pililla (Valladolid), Spain.  
Entry Deadline: 8/1/2016  
[cervezamilana.com](http://cervezamilana.com)

**August 27**  
**National Capital Homebrew Competition**  
Ottawa, ON, Canada.  
Entry Deadline: 7/22/2016  
[nationalcapitalhomebrew.tumblr.com](http://nationalcapitalhomebrew.tumblr.com)

**August 27**  
**Operation Fermentation**  
Katy, TX.  
Entry Deadline: 7/29/2016  
[cialers.org](http://cialers.org)

**September 1**  
**Schooner Homebrew Championship**  
Racine, WI.  
Entry Deadline: 8/15/2016  
[theschooner.org](http://theschooner.org)

**September 3**  
**Concurso Nacional - Lamas Brew Day**  
Campinas, São Paulo, Brazil.  
Entry Deadline: 8/1/2016  
[loja.lamasbrewshop.com.br/concurso-lamas-brew-day.html](http://loja.lamasbrewshop.com.br/concurso-lamas-brew-day.html)

**September 4**  
**High Desert Brewers Association and Eastern Idaho State Fair**  
Blackfoot, ID.  
Entry Deadline: 8/12/2016  
[highdesertbrewers.wordpress.com](http://highdesertbrewers.wordpress.com)

**September 6**  
**Picnique Belga**  
North Kansas City, MO.  
Entry Deadline: 8/28/2016  
[graintoglass.biz](http://graintoglass.biz)

**September 7**  
**Toronto Micro Brewery Challenge**  
Toronto, ON, Canada.  
Entry Deadline: 8/26/2016

**September 10**  
**UK National Homebrew Competition**  
Bristol, UK.  
[nationalhomebrewcompetition.org.uk](http://nationalhomebrewcompetition.org.uk)

**September 10**  
**State Amateur Brewers Show of South Australia**  
Adelaide, Australia.  
Entry Deadline: 8/26/2016

**September 11**  
**2016 Sonoma County Harvest Fair Home Brew Competition**  
Santa Rosa, CA.  
Entry Deadline: 8/31/2016  
[harvestfair.org/homebrew](http://harvestfair.org/homebrew)

**September 17**  
**III Concurso Estadual da ACervA-ES**  
Vitória, Espírito Santo, Brazil.  
Entry Deadline: 9/12/2016  
[acervaes.com.br](http://acervaes.com.br)

**September 17**  
**Rocktober Fest Homebrew Competition**  
Redmond, OR.  
Entry Deadline: 9/12/2016  
[cahomebrew.org](http://cahomebrew.org)

**September 17**  
**Pécsi Sörverseny**  
Pécs, Baranya, Hungary.  
Entry Deadline: 9/15/2016

**September 17**  
**Commander SAAZ**  
Cocoa Beach, FL.  
Entry Deadline: 8/22/2016  
[saaz.org/cms/?page\\_id=1850](http://saaz.org/cms/?page_id=1850)

**September 17**  
**Tulsa State Fair Homebrew Competition**  
Tulsa, OK.  
Entry Deadline: 9/9/2016  
[tulsastatefair.com](http://tulsastatefair.com)



For an up-to-date calendar  
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[HomebrewersAssociation.org](http://HomebrewersAssociation.org)

By Emily Hutto

***Pro Brewers Reflect on Their Homebrewing Roots***

**Editor's Note:** Many pro brewers continue to homebrew even after years or decades of brewing commercially. Homebrew Homecoming is a series in which we invite the professionals to reflect upon their early days as homebrewers, offering wisdom and recipes to Zymurgy readers along the way. We hope their stories inspire you to brew eagerly and brew often.

# Fal Allen, Anderson Valley Brewing Company

**F**rom a beer-barren island to some of the world's most exotic destinations, with many breweries in between, Fal Allen has circumnavigated the globe to brew great beer. A craft beer industry veteran, author, and curry aficionado, Allen remains a homebrewer at heart. After nearly 30 years of professional brewing, he still whips up the occasional batch on his back porch in Boonville, California.

"Slow boat."

That's how Fal Allen, brewmaster at Anderson Valley Brewing Company, describes the means by which most beer made its way from the U.S. mainland to his native Hawaii. The beer, "ill-treated American light lager" as he describes it, was stored in hot warehouses and garages before it finally hit taps and liquor stores. For those who grew up on Hawaii deprived of fresh craft beer, stale, slow-boat lager was just part of island life. But, as is often the case, a great beer can change things forever.

Fal's personal epiphany came at the age of 17 in the form of Watneys Red Barrel. "I had no idea beer could taste good," he says of the bitter ale from now-defunct UK brewery Watney Combe & Reid. "I wanted to learn more, to know why those beer experiences could be so different."

He would earn a degree from the University of Hawaii at Manoa and move to Seattle before he would start homebrewing. "But once I did, I was hooked."

## Setting Sail

Fal started brewing in his basement just

one year after Charlie Papazian's *The Complete Joy of Homebrewing* was published. As remains the case for many homebrewers even today, Charlie's was the first homebrewing book he owned.

Also on the shelf was Greg Noonan's *Brewing Lager Beer* (now available from Brewers Publications as the revised and expanded *New Brewing Lager Beer*). "Greg's book was the first book I saw that was focused on the deeper science of brewing," says Allen. "I tried to brew at least one of everything when I was a homebrewer, but I'm partial to lagers."

"One of everything" included an attempt at hard root beer. "I wanted it both to be alcoholic and have the sweetness of a soda pop," Allen explains. "It was a bad idea: I soon had exploding bottles in my basement. I spent



months cleaning it up and picking sticky shards of glass out of the walls."

Fal brewed his first three batches using a homebrew kit with "plastic buckets and the like, brewing in a kitchen pot," and he remembers them well. "The recipe came off the can of hopped Munton & Fison malt extract—it was a 'homebrew kit' for stout," he says, joking, "The resulting beer tasted pretty good, considering."

Only three batches in, he inherited a haul of homebrew gadgets and professional draft equipment in a fire sale. "Suddenly I had all these pieces to the brewing puzzle, and I felt obligated to learn how to use them properly," he says.

So, Fal built a three-vessel system using old kegs that netted 11 gallons of cooled wort. "It isn't all that fancy," he says. "In

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### "YOU DON'T NEED VERY MANY BELLS AND WHISTLES IF YOU'RE A CAREFUL HOMEBREWER."

---

fact, you don't need very many bells and whistles if you're a careful homebrewer. I have a perforated stainless screen in the lauter tun and a gas fired kettle. I usually ferment in stainless—old kegs too damaged to be used by a brewery but suitable for a homebrew fermenter—and I ferment with viable liquid yeast in a refrigerator that has good temperature control."

That viable yeast is critical. In fact it's the difference between drinkable beer and great beer, Allen says. "Recipe and process are less important than being clean (you can't be too clean) in the brewhouse and having good yeast," he advises. "When I first started homebrewing, yeast was of the dried packet variety, much like bread yeast. Dave Logsdon and Wyeast were a godsend to quality brewing. Chris White and White Labs came along soon after and gave us even more excellent choices."

#### The Journey to Bar Pilot

Allen homebrewed for three years in Seattle before taking—or, rather, begging for—a brewing job at Redhook Brewery.

"Once I landed in the beer business I was lucky," Allen wrote on his blog, [The Goat Rodeo](http://pau-hanatime.blogspot.com) ([pau-hanatime.blogspot.com](http://pau-hanatime.blogspot.com)). "I was lucky to beg my way on at Redhook Brewery. Then-brewmaster Rick Buchanan took the time to have me work at each job, in each department."

That luck continued, Allen says, at Pike Place Brewery in Seattle (now called The Pike Brewing Company), Archipelago Brewery in Singapore, Anderson Valley Brewing Company in Boonville, and a few short stints at other breweries.

"My career in brewing has taken me to more than 30 countries around the world," he recalls. "Some of these trips were to judge beer, others to lecture about beer, some to set up breweries, and others to work in breweries and make beer. During each of these trips I learned about local brewing customs and using the local ingredients."

In his travels, Fal also developed an affinity for curry. He draws a parallel between the many varieties of curry and the growing diversity of beer styles. "Curries can be red, green, yellow, brown. Thai, Indonesian, Indian, Malaysian, Japanese. Beef, pork, seafood, vegetable. Spicy, creamy, savory. And these are just some of the variations."

Like curry, beer can be a canvas for myriad flavors. "Thanks to the brewers I've met across the globe, I am more

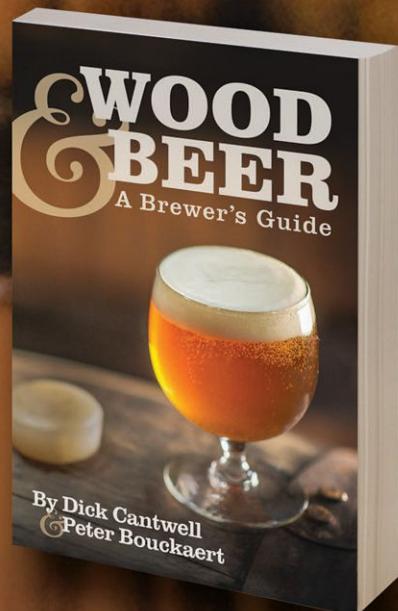
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## THE BREWER'S BOOKSHELF

Fal Allen isn't just a noteworthy brewer, he's also a notable beer writer. He is, along with Dick Cantwell, co-author of the Brewers Publications title *Barley Wine: History, Brewing Techniques and Recipes*, and he has contributed to numerous beer pub-

lications, including *Zymurgy*, *American Brewer*, *The New Brewer*, *Celebrator Beer News*, and *Malt Advocate* (now *Whisky Advocate*).

Needless to say, Fal is a great person to turn to for book recommendations. Here's his reading list for homebrewers.

If you're just getting started...

- *Dave Miller's Homebrewing Guide*, Dave Miller

- *The Complete Joy of Homebrewing*, Charlie Papazian

"When I started out, I referred to this book often," Allen says of *The Complete Joy*. "It's a great homebrewing book about having fun."

If you want a historical perspective...

- *A Textbook of Brewing*, Jean De Clerck

And if you're getting more technical...

- *Technology Brewing and Malting*, Wolfgang Kunze
- *Handbook of Brewing*, William Hardwick
- *The Practical Brewer*, Master Brewers Association of the Americas
- *Brewing Microbiology*, Fergus Priest
- *Brewing Lager Beer*, Gregory Noonan

"There was nothing else like it out there at that time," Allen says of *Brewing Lager Beer*, the book that influenced his homebrewing the most. "It was more for the advanced homebrewer and the microbrewer, a very new concept in 1986. A few years later I met Greg at the Great American Beer Festival and we became friends. He was always open to sharing his knowledge, discussing brewing, or having a beer and a laugh."

## Oatmeal Stout

Fal Allen,

Anderson Valley Brewing Company

### INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

**4.5 lb.** (2.04 kg) light malt extract syrup  
or

**3.63 lb.** (1.64 kg) light dry malt extract

**2 lb.** (0.9 kg) pale malt

**0.75 lb.** (340 g) 40° L crystal malt

**0.75 lb.** (340 g) 80° L crystal malt

**0.75 lb.** (340 g) Munich malt

**1.6 oz.** (45 g) Roasted barley

**1 lb.** (0.45 kg) Chocolate malt

**1.25 lb.** (0.57 kg) Flaked oats

**0.2 oz.** (6 g) Bravo pellets, 15.5% a.a. (60 min)

**0.15 oz.** (4 g) Northern Brewer pellets, 8.5% a.a. (10 min)

White Labs 002 English Ale

or Wyeast 1968 London ESB yeast

**Original Gravity:** 1.060

**Final Gravity:** 1.013–1.016

**IBUs:** 11

**SRM:** 29

**ABV:** about 6%

**Total Efficiency:** 75%

### PARTIAL-MASH RECIPE

Mash malts with 2 gal. (7.5 L) water at 150° F (66° C) for one hour. Drain, rinse grains, and dissolve extract completely in the hot liquid. Top off to desired boil volume and proceed with boil. Chill, top up with water if necessary, and ferment at 66–69° F (19–21° C) to completion before packaging.

### ALL-GRAIN VERSION

Omit malt extract, increase pale malt to 7.75 lb. (3.52 kg), and mash with remaining grains at 150° F (66° C) for 60 minutes. Collect enough clear wort into kettle to yield a 5.5-gallon (20.82 L) fermentation volume and proceed as above.

## Wee Geech Pale Ale

Fal Allen, Anderson Valley Brewing Company

### INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

**6.38 lb.** (2.89 kg) Pale malt extract syrup or 5.25 lb. (2.38 kg) light dry extract

**0.5 lb.** (227 g) Victory malt

**0.25 oz.** (7 g) Bravo pellets, 15.5% a.a. (60 min)

**0.5 oz.** (14 g) Chinook pellets, 13% a.a. (10 min)

**0.5 oz.** (14 g) Amarillo pellets, 8.5% a.a. (10 min)

**1** large stick of lemongrass, chopped (10 min)

**0.5 oz.** (14 g) Chinook pellets, 13% a.a. (steep 10 min)

**0.5 oz.** (14 g) Amarillo pellets, 8.5% a.a. (steep 10 min)

**1 oz.** (28 g) Amarillo pellets, 8.5% a.a. (in primary, 3rd day)

White Labs 002 English Ale or Wyeast 1968 London ESB yeast

**Original Gravity:** 1.044

**Final Gravity:** 1.010

**IBUs:** about 32

**SRM:** 4.2 (all grain) to 7.1 (extract)

**ABV:** 4.7%

**Total Efficiency:** 75%

### DIRECTIONS

Steep milled Victory malt in 170° F (77° C) water for 30 minutes. Drain, rinse grains, and dissolve extract completely. Top off to desired boil volume and proceed with boil. Add hops and lemongrass with final Amarillo addition added to primary fermenter on the third day of fermentation. Ferment at 66–69° F (19–21° C) to completion and package.

### ALL-GRAIN VERSION

Substitute 8.5 lb. (3.86 kg) pale malt for extract. Mash at 150° F (66° C) for one hour. Run enough clear wort into kettle to yield a 5.5-gallon (20.82 L) fermentation volume and proceed as above.

open to unusual flavors in beer, and to using unusual ingredients," he says. "At every one of these places, I met brewers who were friendly, welcoming, enthusiastic about their craft, and excited to talk about beers and exchange ideas."

### Winds of Change

A seasoned veteran of the craft brewing industry, Allen notes that much has changed since he first started homebrewing. "Back in the 80s, most homebrew shops sold a lot more home winemaking equipment. When I started homebrewing and shopping at Liberty Malt Supply (which became Pike Place Brewery), a homebrew shop had malt extract and maybe some old, yellow, whole-flower hops, if you were lucky," he remembers.

"And books: in a homebrew shop you might find two or three. By and large there was very little educational material out there for the homebrewer. Now there are so many great books on beer and brewing that you can hardly keep

up with it all, and a big part of that is due to Charlie Papazian and the brewing organizations he started," Fal says, adding, "Thank you, Charlie!"

One thing that hasn't changed, though, is the creative, collaborative spirit of brewers around the world: "The brewers I have met and the flavors and ideas we have exchanged have had a profound impact on my brewing and my sense of community," he says.

It's a community he has cultivated over three decades and tens of thousands of miles. And it all started with one, life-changing beer.

**Emily Hutto is a craft beer storyteller, certified saké specialist, and Colorado-based journalist who has spent many of her days picking the brains of the country's best brewers. She is the author of the book *Colorado's Top Brewers* and is a contributing editor at *Craft Beer & Brewing* magazine.**

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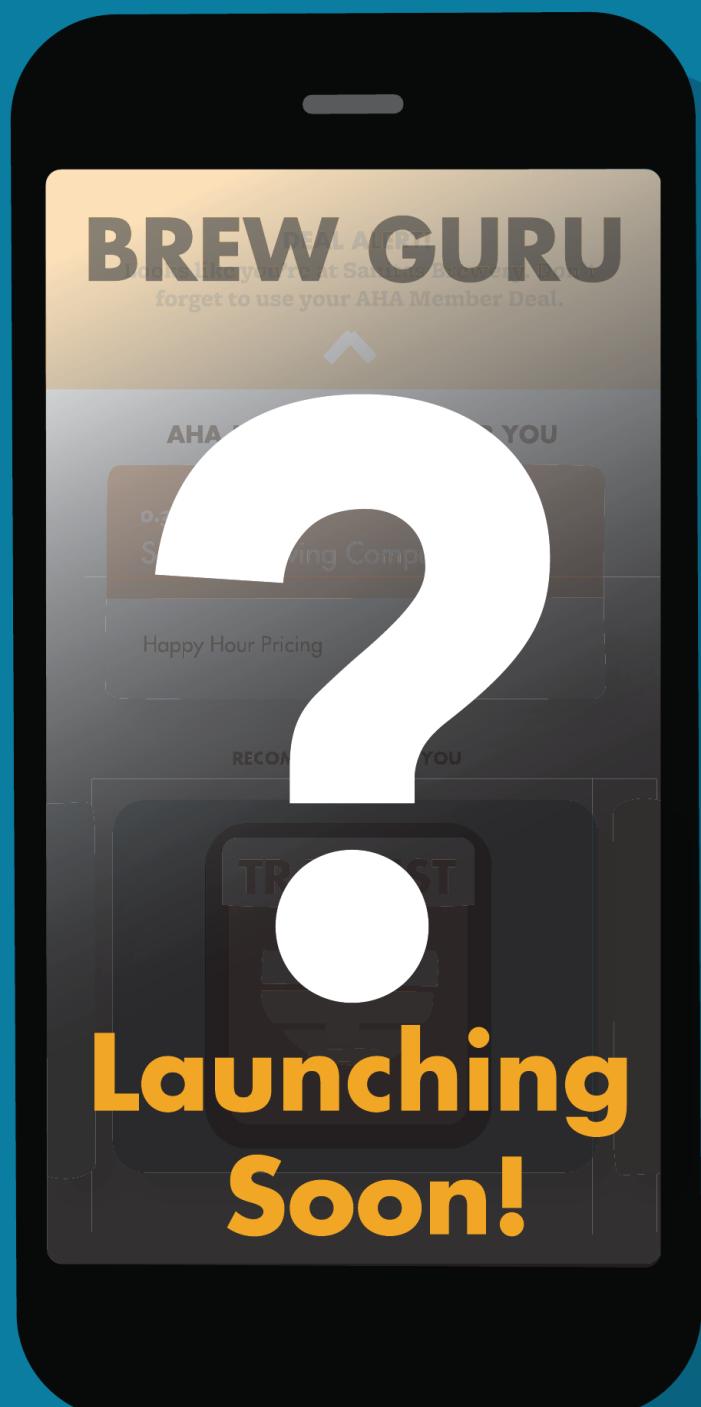
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80

July/August 2016



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



**S**ummer's here, and that means one thing—time to grill. Whether you're a committed carnivore or a voracious vegetarian, cooking over an open flame *en plein air* is guaranteed to make you rumble in your tumby. And what better to wash down a plate of grilled delights than a great beer?

Two great beers, that's what.

German breweries like Schlenkerla and Spezial are deservedly famous for rauchbier, a specialty of Bamberg. But American craft brewers have learned to embrace

smoked malt as well. This month we asked our judges to evaluate two craft beers that pair perfectly with the grilled goodies of summer.

First up is Smoke & Dagger from the wicked good lager brewers at Jack's Abby, located west of Route 128 and south of the Pike in Framingham, Massachusetts.

“Cloaked in mystery, this dark black beer skirts the line between a schwarzbiere and smoked porter,” says the brewery. “The use of a small percentage of traditional beechwood-smoked malt adds complexity and balances the liberal use of chocolate malt. Notes of roasted grains, beechwood smoke, and coffee accompany a full-bodied and sweet chocolatey malt character.”

Smoke & Dagger weighs in at 1.057 specific gravity ( $14^{\circ}$  P), 25 IBUs, and 5.8 percent alcohol by volume. At press time, it was available in Massachusetts, Vermont, New York, Connecticut, and Pennsylvania.

Our second beer is Smoked Porter from Alaskan Brewing Co. in Juneau. Originally developed in 1988, Smoked Porter has gained a worldwide following for its supreme cellar-worthiness.

The brewers say, “The dark, robust body and pronounced smoky flavor of this limited edition beer make it an adventuresome taste experience. Alaskan Smoked Porter is produced in limited ‘vintages’

**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.



**Jack's Abby**  
[jacksabby.com](http://jacksabby.com)

**Alaskan Brewing Co.**  
[alaskanbeer.com](http://alaskanbeer.com)

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

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

each year on November 1 and, unlike most beers, may be aged in the bottle much like fine wine.”

Smoked Porter features an original gravity of 1.068 ( $16.5^{\circ}$  P), balanced by 45 IBUs and 6.5 percent ABV. At press time it was available in most western states, as well as Texas, the Dakotas, Minnesota, Wisconsin, and Michigan.

# THE SCORES

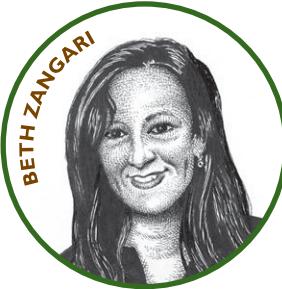


Smoke & Dagger—Jack's Abby, Framingham, Mass.  
BJCP Category: 32A, Classic Style Smoked Beer (Schwarzbier)

## THE JUDGES' SCORES FOR SMOKE & DAGGER



DAVE HOUSEMAN



BETH ZANGARI



SCOTT BICKHAM



GORDON STRONG

**Aroma:** Light smokiness and roasted malt character with hints of coffee. Very light noble hop aroma. Clean fermentation without noticeable esters, dimethyl sulfide (DMS), or diacetyl. Alcohol not evident in aroma. (9/12)

**Appearance:** Very dark brown with ruby highlights. Brilliant clarity. Dense, rocky, tan head with excellent retention. (3/3)

**Flavor:** Roasted malt is quite assertive, as is the hop bitterness. No hop flavor. Smoky notes are there but in a subordinate role. No fruity esters, diacetyl, or DMS. Lingering bitterness in the aftertaste. Fairly dry finish. Not quite a schwarzbiere or smoked porter. Alcohol not very noticeable. (16/20)

**Mouthfeel:** Medium body with a dry mouthfeel. Smooth and silky, with lingering bitterness and astringency to the mouthfeel. A bit harsh. Low alcohol warming. (4/5)

**Overall Impression:** This beer is described as skirting the line between a smoked porter and a schwarzbiere. While there is smokiness, it is a bit subtle for a smoked beer. The bitterness is too high for a schwarzbiere and the roastiness too assertive. It leans more toward smoked porter than it does schwarzbiere, though the low ester profile gives an impression of a lager more than an ale. Certainly a very drinkable mash-up of styles. For a smoked schwarzbiere, I suggest more smoke and less bitterness. As a smoked porter, more fermentation esters would be appropriate. Still, this is a good beer to enjoy with oysters, either raw or as oysters Rockefeller. (7/10)

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

**Aroma:** First impression is pronounced melanoidin richness, like malted chocolate milk and graham crackers. Instead of hop aromas, there are hints of oak firewood smoke with stronger notes of fresh-cut beechwood. Fermentation is clean. (10/12)

**Appearance:** Deep reddish black with brilliant clarity. Creamy, light, tan foam falls slowly, leaving a thick ring around the glass. (3/3)

**Flavor:** First notes are of smoked bacon, followed by a rich, full, sweet maltiness with graham cracker accents. These give way to a slightly roasty, fairly bitter midpoint that evolves to a dry, slightly roasted finish with moderate underlying bitterness. The rich malt notes and low smokiness become almost an afterthought—still present, but the focus at the finish is toward somewhat dry, elegant roast. Balance shifts between big, full malt up front, to moderate sweetness with balancing hop bitterness, then a clean, lightly roasted finish with lingering bitterness. (15/20)

**Mouthfeel:** Medium-full bodied with moderate carbonation. Alcohol warmth is subdued and rather understated next to the dry roast finish and tingling hops. (5/5)

**Overall Impression:** Starts with an interesting complexity that lasts through the finish. An aptly named beer: daggers are the fairly assertive hop bitterness and the dry roast finish cloaked with bacon-like smoke and rich, sweet maltiness. Drinks robust, with a Pilsner-like hop presentation, and with the elegance of a schwarzbiere backbone. The smoke is also elegant, carrying through from first sip to finish without overpowering the other components. (9/10)

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

**Aroma:** Smoked beechwood aroma is a predominant component, but I pick up low levels of bittersweet chocolate and toffee underneath. There are very low apple esters with a whisper of alcohol sweetness. (9/12)

**Appearance:** Very dark brown with ruby highlights. The head forms a uniform and persistent layer of beige bubbles on the surface. Excellent clarity. (3/3)

**Flavor:** There is a surprising amount of malt complexity given the somewhat one-dimensional aroma. The first impression yields toasted and caramel malts, which are transformed into a mix of smoky and roasted flavors in the finish. Bittersweet chocolate notes are also present. Light, fruity esters are in the background. The finish is balanced towards bitterness, with contributions from the roasted malts, smoke phenols, and hops. A slight sourness lingers. (15/20)

**Mouthfeel:** Moderate creaminess and carbonation, and there is low alcohol warmth. Residual sugars leave a little stickiness on the lips. It finishes with a medium-low astringency, which, along with metallic notes, makes the finish a little harsh. (3/5)

**Overall Impression:** This is a very nice beer with a good balance between the smoked and roasted malts, although the latter leave a little sharpness in the finish. The bitterness is on the high side for a smoked beer. Nonetheless, this is a well-crafted and interesting beer. (7/10)

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

**Aroma:** Mild aroma with a blend of malty richness, dark chocolate, and a slightly sharp smoky overtone. Light hop character, hints of herbs and grass. Overall intensity is medium-low with the smoke riding on top of the other aromatics. Generally clean. The smoke has a sharp, charred character. (9/12)

**Appearance:** Tall, tan head. Tiny bubbles pushing up a frothy head that settles slowly. Very dark mahogany brown. Nearly opaque but clear when held to a light. (3/3)

**Flavor:** Clean lager smoothness with a smoky-harsh finish. Moderate bitterness shows up late. The initial impression is quite malty with the smoke-accentuated bitterness taking over mid-palate. Medium hop flavor, herbal and a touch citrusy. The bitterness and hops add a very light acidic note to the smoke. The malt is relatively neutral with some chocolate-like notes. Finish is attenuated but full. Clean fermentation. (14/20)

**Mouthfeel:** Full-bodied and chewy. Moderately high carbonation. Moderate smoky astringency. The dextrinous body gives it a slightly creamy feel but mostly it has a weight to it. Seems rather full in the mouth. (3/5)

**Overall Impression:** The smoke is relatively balanced in intensity but somewhat sharp in character with an acrid bite. The beer has a nice lager smoothness but seems rather dextrinous and thick on the palate. The base beer is somewhat lost, and it doesn't really have the continental malt richness of a schwarzbiere. The smoke bites along with the bitterness and combines with the char of the smoke to make the aftertaste slightly harsh. (7/10)

**Total Score: (36/50)**



## THE JUDGES' SCORES FOR 2015 ALASKAN SMOKED PORTER



DAVE HOUSEMAN



BETH ZANGARI



SCOTT BICKHAM



GORDON STRONG

**Aroma:** Inviting smokiness with light fruity esters and a bit of crystal/caramel notes. No hop aroma. No DMS or diacetyl. Some alcohol aroma blends well with the malt and smoke. (10/12)

**Appearance:** Black. Opaque with some ruby highlights. Dense, creamy, tan head with excellent retention. (3/3)

**Flavor:** Roasted malts with substantial caramel underpinnings. High hop bitterness balances the malt profile. No hop flavor. Dark prune and raisin fruity esters add to the complexity. Some chalky, mineral notes in the aftertaste. Lingering bitterness with some residual sweetness—not dry, but a balanced finish. Hints of alcohol but subtle for a beer with this ABV. No DMS. No diacetyl. (18/20)

**Mouthfeel:** Medium to full body. Smooth, creamy mouthfeel with lingering bitterness but no astringency. Moderate alcohol warming. (5/5)

**Overall Impression:** A truly classic smoked porter highlighting the smoke, the roasted malts, balancing hops, and ale fermentation. Chalky finish is somewhat distracting; perhaps it's the water chemistry. This might subside as the beer ages. This 2015 version is still young. The beer will be good in a vertical tasting 10 years from now. Enjoy this smoked porter with seafood or steaks; it will stand up to both and enhance the character of each. (9/10)

**Total Score: (45/50)**

**Aroma:** Pronounced caramel malt sweetness up front dominates the first whiff but fades quickly to dominant bacon and coffee cooked over a spring campfire, as hints of evergreen linger in the back. Lightly fruity fermentation, like clean, not-quite-ripe pears, plums, and cherries—but from a cold walk-in fridge, not a farmers market bin. (9/12)

**Appearance:** Black with red highlights when held to the light. Low head formation and retention, though a light, off-white mist lies across the surface and laces the glass. Very clear. (2/3)

**Flavor:** Alder-smoked bacon and campfire up front are followed by rich notes of dark chocolate in the first sip. Light pear and dried plum/prune esters emerge providing complexity and balance to the richness of that first sip. Smoke emerges in the middle and lingers after the last swallow. A moderately low hop bitterness and light toast swing the balance away from a surprisingly sweet chocolate maltiness. Finishes somewhat dry, with a hint of roast on top of the toast. (16/20)

**Mouthfeel:** Medium- to full-bodied, with semi-soft carbonation for a silky texture. Moderate alcohol warmth tingles past the somewhat dry finish. (5/5)

**Overall Impression:** All the best flavors are present: cocoa (chocolate), campfire bacon, and roasty sweetness, like chocolate-covered, bacon-wrapped, fire-roasted sweet peppers. It's like breakfast, dinner, or even dessert around the campfire, wrapped in a silky, cozy blanket. Now all that's missing are the tasty treats above, with maybe a little fresh goat cheese to complement. (9/10)

**Total Score: (41/50)**

**Aroma:** Smoke-laden aroma with very low charcoal-like sharpness. Toasted malt forms the backbone with some added complexity from light toffee and chocolate notes. Some alcohol is apparent, along with moderate pear and apple esters. There is not much roast aroma—the base style seems closer to an English porter than an American. (9/12)

**Appearance:** Dark brown with excellent clarity and a creamy beige head that takes a long time to fade. Excellent conditioning. (3/3)

**Flavor:** The malt profile is long and complex. Smoke comes through late and is assertive without being aggressive. The initial malt character has notes of dark chocolate and toffee, along with a little molasses. These fade into smoke and coffee components. Hop bitterness is enhanced by the roasted malts. There is enough residual sugar to maintain a neutral hop-malt balance. A light fruitiness is present, but it's less pronounced than in the aroma. (18/20)

**Mouthfeel:** There is good creaminess from the carbonation, which is moderately high but not too gassy. The body is medium, with a touch of warmth and a low astringency that is just barely noticeable, but not at an inappropriate level for this style. (5/5)

**Overall Impression:** The balance, complexity, and smooth finish are the highlights of this beer. The malt transitions through different layers of flavors, but they are in balance with the hops and not too sweet, smoky, or roasty. The aroma is decidedly smoky, but pleasant, and the fruity esters add some additional complexity. Great job on the recipe and technical execution! (10/10)

**Total Score: (45/50)**

**Aroma:** Rich smoke character that has an inherent sweetness without burnt notes. The malt provides a rich sweetness in support, but the smoke isn't sharp. There is a light fruity quality over a dark chocolate and caramel undertone. Very clean, moderately strong, with the smoke well integrated. (11/12)

**Appearance:** Large head, light brown in color, average persistence. Very dark brown color. Opaque, but clear to a light. (3/3)

**Flavor:** Rich malty base, light caramel and moderate dark chocolate, with the smoky component providing a good stand-in for roast. There is a residual sweetness in the beer that plays well with the smoky-fruity sweetness of the wood. The bitterness is medium, but the sweetness masks the effect a bit and allows the smoke to emerge fully in the aftertaste. (18/20)

**Mouthfeel:** Medium-full body. Moderate carbonation. Lightly creamy. Not harsh or astringent. Very light alcohol warmth that will likely smooth out with age. (4/5)

**Overall Impression:** Delicious porter with well-integrated smoke. The quality of the smoke is outstanding, and it lacks the acrid harshness found in lesser examples. I think the residual sweetness helps smooth the presentation. The alcohol is just a bit too noticeable for me, but I think this will improve with age. I think this beer works so well because the roast and bitterness aren't too high, there is some malty sweetness to balance the smoke, and the choice of wood is flavorful and not charcoal-like. I'm saving a few points because this will likely improve with age (hint, hint...). (9/10)

**Total Score: (45/50)**

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By Charlie Papazian



## Retro Rocky Raccoon's Honey Lager

**E**very one of my recipes has a story or reason behind its name. Thinking back to the 1970s and the homebrew classes I used to teach in Boulder, Colo., all of my recipe names were celebrations of our zany selves and the fun experiences we had as homebrewers. We were beer explorers, and the resources we had back then were few.

Books with recipes simply outlined formulations for pale ale, stout, porter, and so on, without the benefit of names to call them. Creative naming of beers was not part of beer culture yet, and even existing breweries of the time didn't put much creative effort in naming their beers. Commercial beer was all about brand names, with *Pilsner*, *bock*, *lager*, or *premium* tagged onto the company name as an aside.

The recipes for Goat Scrotum Ale and Rocky Raccoon's Honey Lager published in my book, *The Complete Joy of Homebrewing*, changed all that. Rocky Raccoon's Honey Lager became one of the most popular—perhaps the most popular—recipe in my book. The idea of adding honey was first introduced with this recipe, and professional brewers and most beer drinkers thought I was nuts to use honey in beer. And the name "Rocky Raccoon" seemed to strike a chord in more ways than one.

In 1968, The Beatles cut their White Album (officially titled *The Beatles*). My parents happened to be taking a short vacation to England at the time of its release, so they brought the White Album home for me about two weeks before it was issued in the USA. At the age of 19, I was one of the first Americans to spin that



vinyl and listen to the two-record set. The song "Rocky Raccoon," to this day, is high in my humming repertoire. It is a classic. And so was my recipe for Rocky Raccoon's Honey Lager. Hundreds of homebrewers have won awards in competitions for their own renditions of this beer.

The recipe in my recent fourth edition of *The Complete Joy of Homebrewing* is the original malt extract recipe, which I've reprinted here as it appears in the book. I've also developed what I imagine would

be a good all-grain version, with a few notable revisions.

Enjoy this original game-changer one way or another. Let's cut the shuck and jive and get on with the recipe.

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

*Recipes continued on page 86 >*

# Rocky Raccoon's Honey Lager

## EXTRACT RECIPE\*

*Rocky Raccoon's Crystal Honey Lager (Original malt extract recipe)*

This is the original and internationally acclaimed Rocky Raccoon's Honey Lager with only improved modifications. Use the lightest malt extract available, the freshest hops and light honey. It is a clean, crisp, exceptionally great tasting light beer with a mellow, aromatic hop flavor. The use of honey encourages a very complete fermentation and a bit higher alcohol content. The lightness of flavor really can

do justice to your finest hops. This recipe should be your foundation for a wide variety of experimenting with toasted malts, hops, other grains and unusual ingredients. It is a real delight and hundreds of homebrewers have won first-place awards at homebrew competitions around the United States with this recipe or a variation of it.

This beer will change its character with age; most who have appreciated Rocky's consider age with respect and happily raised eyebrows of disbelief.

Rocky's has a slight resemblance to the character of some stronger types of very light Belgian Ales.

## INGREDIENTS

for 5 U.S. gallons (19 L)

<b>3.5 lb.</b>	(1.6 kg) plain extra-light dried malt extract
<b>2.5 lb.</b>	(1.1 kg) light clover honey
<b>1.5 oz.</b>	(42 g) Cascade hops (boiling): 7.5 HBU (210 MBU); or try 2 oz. (56 g) Saaz for a Pilsner-like character
<b>0.5 oz.</b>	(14 g) Cascade hops (finishing)
<b>0.25 tsp</b>	(1 g) powdered Irish moss
	American lager, Pilsner-type yeast, American Ale yeast or White Labs Cry Havoc yeast
<b>0.75 cup</b>	(175 ml) corn sugar or 1.25 cup (300 ml) dried malt extract (for bottling)

**Target Original Gravity:** 1.048–1.052 (12–13 B)

**Target Final Gravity:** 1.004–1.008 (1–2 B)

**IBUs:** 23

**Approximate Color:** 4 SRM (8 EBC)

**Alcohol:** 5.8% by volume

## DIRECTIONS

Add the malt extract, honey and boiling hops to 1½ gallons (5.7 L) of water and boil for 60 minutes. Add Irish moss for the last 10 minutes of the boil. Add the finishing hops during the final 2 to 4 minutes of boiling. Strain, sparge and transfer immediately to 2 gallons (7.5 L) of cold water in the fermenter. Top off with additional water to make 5 gallons (19 L). Add the yeast when cool and ferment to completion. Bottle when fermentation is complete.

\*From *The Complete Joy of Homebrewing*, fourth edition, by Charlie Papazian, William Morrow Paperbacks, with minor formatting changes.

## ALL-GRAIN RECIPE

## INGREDIENTS

for 5 U.S. gallons (19 L)

<b>5.75 lb.</b>	(2.6 kg) Pilsner malt
<b>2.5 lb.</b>	(1.13 kg) Honey added after boiling is finished. <b>Do not boil honey.</b> (Choose a honey known for its perfume-like floral aroma and flavor, such as orange blossom, basswood, linden tree, tropical climate honey, etc.)
<b>1 oz.</b>	(28 g) Cascade hops 5% a.a. (5 HBU/140 MBU), 60 minute boil
<b>0.5 oz.</b>	(14 g) Aramis, Mt. Hood, Santiam, or U.S. Tettnang hop pellets, dry hop
<b>0.25 oz.</b>	(7 g) dried aromatic jasmine flowers (optional), added during dry hopping
<b>0.25 tsp.</b>	(1 g) powdered Irish moss
	American lager yeast, Pilsner-type yeast, American ale yeast, or White Labs Cry Havoc yeast
<b>0.75 cup</b>	(175 ml) corn sugar for priming bottles, or 0.33 cup (80 ml) corn sugar for kegging

**Target Original Gravity:** 1.050 (12.5 B)

**Target Extract Efficiency:** 79%

**Approximate Final Gravity:** 1.008 (2 B)

**IBUs:** about 23

**Approximate Color:** 4 SRM (8 EBC)

**Alcohol:** 5.5% by volume

## DIRECTIONS

A step infusion mash is employed to mash the grains. Add 6 quarts (5.7 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 3 quarts (3 L) of boiling water and add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Then raise temperature to 167° F (75° C), lauter, and sparge with 3.5 gallons (13.5 L) of 170° F (77° C) water. Collect about 5.5 gallons (21 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,

*Continued >>*

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add the Irish moss. After a total wort boil of 60 minutes, turn off the heat, stir in the honey, and place the pot (with cover on) in a running cold-water bath for 30 minutes, or use other methods to chill wort. Then strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5 gallons (19 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 a temperature around 55° F (12.5° C) for about one week, or until fermentation shows signs of calm and stopping. Rack from primary to secondary and add the hop pellets and optional jasmine flowers for dry hopping. If you have the capability, "lager" the beer at temperatures between 35 and 45° F (1.5–7° C) for 3 to 6 weeks.

Prime with sugar and bottle or keg when complete.

**SS BRITE TANKS**

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# A Homebrewer's Evolution: 35 Years and Counting

In the autumn of 1978, I enrolled as a graduate student at the University of Oxford in the United Kingdom. Traditional English bitters were everywhere, but I quickly fell in love with Southern English brown ale, which had moderate alcohol, plenty of sweetness, and a mild malt flavor. At the time, 20-ounce British pints of beer were about 75 pence each (approximately \$1.25 back then) and were as cheap to enjoy in the pubs of Oxfordshire as they were to take home in bottles from the markets.

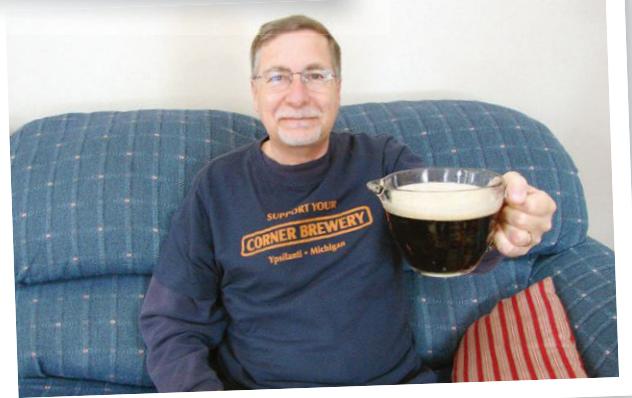
My wife Vickie and I were newlyweds, and we soon took an interest in homebrewing. The local Woolworth's sold brown ale kits that included a can of hopped malt extract and a packet of dry ale yeast. We merely had to mix the extract with water in a fermenter, add some sugar, and wait four to seven days. Our fermenter was pretty crude—a plastic bag in a pasta pot—but it made beer.

Well, at around 8 to 10 percent alcohol by volume, our beer was just drinkable and had quite a yeasty bite. Despite my training as a microbiologist, we had no real approach to sanitation, but our apartment's cool room temperature likely helped us reduce environmental bacterial contamination. We did not have heat in the kitchen, and I suspect most of our homebrews fermented at 50° to 60° F (10° to 16° C), if that. We returned to the States in 1980, but we did not continue brewing: with new jobs and new roles as parents, we just didn't have time.

Now, fast-forward 30 years. In 2009, our son Nick accepted a position as a postdoctoral fellow at Oxford University of all places, and he asked us to store his homebrewing equipment, which he had used during



Roger Brideau  
enjoying homebrew  
in 1978 and 2015.



the previous four years while completing his PhD at Cornell. Thus, with idle equipment and plenty of time, our interest in homebrewing was renewed. And unlike in the early 1980s, when homebrewing was just starting to take off in the United States, we enjoyed the benefit of well-established sources of ingredients and equipment. We call our home brewery Empty Nest Brewing, and we now brew continuously, putting up 1,400 bottles a year.

Our friends, neighbors, and relatives are happy to have us supply them with samples of traditional British craft ales, and we are glad to do so. Occasionally we make a big West Coast IPA for our daugh-

ter Claire and her husband Tom, who live in Seattle. I have extended my interest in craft beer to include part-time work as a Cicerone Program Certified Beer Server at a local bar in Ann Arbor that has 36 craft beer taps, and I now teach classes on beer appreciation and homebrewing at the local community college.

Thirty-five years later, we're still enjoying those malty brown ales, and even my choice of mug remains the same. Bottoms up!

**Roger Brideau is a retired medical bacteriologist from Ann Arbor, Mich. who pours beer as a craft beer bartender one afternoon a week.**

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