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Cheers to Success

As our annual Best Beers in America issue, the July/August Zymurgy becomes an unofficial tribute to professional craft brewers each year. Along with the much-anticipated results of our 13th annual survey of the best commercial beers in America plus clone recipes, this issue also has some great advice for how to create clone recipes on your own, as well as an article on writing a business plan and securing financing in case you're among the hundreds of people currently thinking about opening their own brewery. (According to the Brewers Association's database, there were a mind-boggling 2,051 breweries in planning by the end of 2014.)

As I write this, the Brewers Association has just wrapped up another record-setting Craft Brewers Conference in Portland, Ore. More than 11,500 attendees met up in "Beervana" April 14-17 for educational seminars, the keynote address from noted author Simon Sinek, a trade show, official and unofficial conference events, technical meetings, and camaraderie.

The craft brewing industry is fast becoming a small business success story in the United States, employing more than 110,000 American workers, and doing so with a pervasive spirit of camaraderie and cooperation.

"You define small business success and the world admires your achievement," BA president and AHA founder Charlie Papazian told the audience during the keynote session.

Here are some news and notes from the conference regarding the state of the craft brewing industry.

- For the second straight year, the craft brewing industry grew 18 percent by volume.
- At the end of 2014, there were 3,418

craft breweries operating in the U.S., with a total of 615 craft breweries opening in 2014.

- For the first time, craft volume market share in the U.S. reached double digits (11 percent).
- Craft beer in the conference's host city, Portland, has an astonishing market share of 46 percent; in the state of Oregon, craft beer's market share is 20 percent.
- Breweries are now opening at a rate of 1.7 per day in the U.S. (up from 1.5 per day in 2013).
- The top craft beer style category in the U.S. is (no surprise here) IPA, which grew 46.9 percent as a category. In scan data, the next popular style "categories" are seasonals, pale ale, variety packs, amber ale, amber lager, and bock.

Of course, a large part of the success of American craft brewers can be contributed directly to homebrewing and homebrewers. Many professional craft brewers started out as homebrewers, and homebrewers are some of the most knowledgeable and sophisticated beer drinkers on the planet, doing their best to support their local and regional breweries.

While sales of craft beer are skyrocketing, and craft breweries are fast becoming a part of the fabric of American communities, "Our hard work is far from over," asserted Gary Fish, chairman of the Brewers Association board and president of Deschutes Brewery.

That's good news for beer lovers, who will have even more craft beers to choose from today and in the future. It's a great time to be a beer drinker (and a homebrewer) in the U.S. Cheers!

Jill Redding is editor-in-chief of Zymurgy.

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



>> GET THERE!

BELGIUM COMES TO COOPERSTOWN

This August, beer fans can break out their long-forgotten mix tapes, windbreakers, and *Pulp Fiction* references for their pilgrimage to Cooperstown, N.Y. "Belgium Comes to Cooperstown," Brewery Ommegang's beer, music, food, and all-things-fun fest, is returning August 7-8 with a '90s theme.

The annual festival offers beer enthusiasts the opportunity to taste hard-to-find Belgian ales from across the pond and Belgian-style ales from all over North America. More than 100 breweries will be on hand, pouring 300 unique beers for the 3,000 attendees. In addition to great beer, BCTC offers gourmet food vendors, live music, on-site camping, fireworks, and much more.

Festivities begin on Friday with a multi-course beer pairing dinner for VIP ticket holders. The festival grounds open at noon on Saturday for patrons holding camping tickets. Tasting begins at 2:30 p.m. for VIP ticket holders and 3 p.m. for general admission. Tasting ends at 7 p.m. On Sunday morning, breakfast will be served from 8 a.m. until noon. For more information, go to ommegang.com.

July 10-12

Seattle International Beerfest

Seattle, WA

seattlebeerfest.com

July 18

The Breastfest Beer Festival

San Rafael, CA

thebreastfest.org

August 13-16

Bend Brewfest

Bend, OR

bendbrewfest.com

July 17-18

Vermont Brewers Festival

Burlington, VT

vtbrewfest.com

July 22-26

Oregon Brewers Festival

Portland, OR

oregonbrewfest.com

August 15

Stone Invitational Beer Festival

Escondido, CA

anniv.stonebrewing.com

July 18

Naperville Ale Fest

Naperville, IL

napervillealefest.com

August 13-16

North American Organic Brewers Festival

Portland, OR

naobf.org

August 29

Breckenridge Summer Beer Festival

Breckenridge, CO

alwaysmountaintime.com/radiate/events/breckenridge-summer-beer-festival

For more craft brewing events, go to CraftBeer.com

>> YOU'VE GOTTA DRINK THIS LA CUMBRE ELEVATED IPA

Excellent hop aroma and bittering without being harsh. Complex hop flavors including citrus, piney, and dank, each distinct and complementary. Malt does not take a back note, and instead provides the basis to feature the hops. Silky mouthfeel encourages those lucky enough to have one to order another.

Reviewed by Steve Marquez
Littleton, Colo.



Share your favorite beer with us! Send your description, in 150 words or fewer, to zymurgy@brewersassociation.org. Feel free to include a photo!



Photos courtesy of Brewery Ommegang:
La Cumbre Brewing Co.

>> BREW NEWS:

PURE WATER BREW CHALLENGE

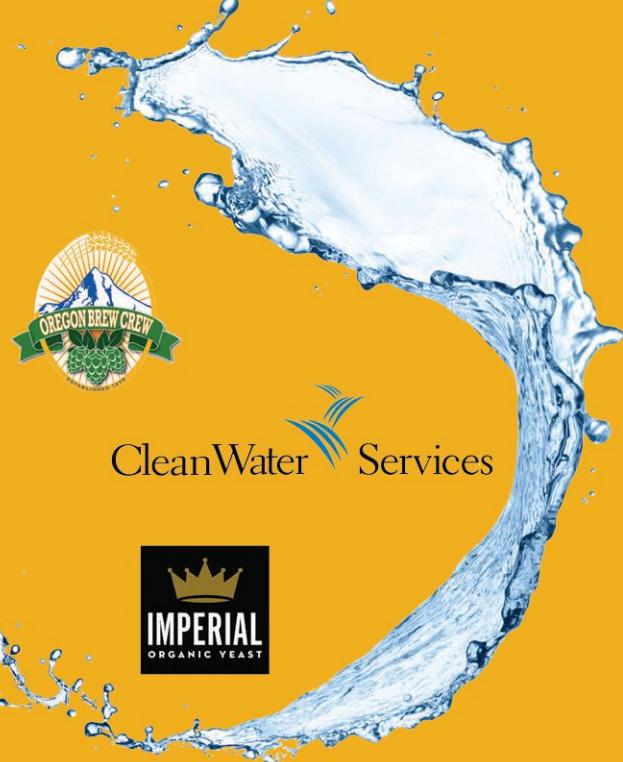
An Oregon wastewater treatment operator has challenged a local homebrew club to make award-winning beer from hops, barley, yeast, and treated sewage water.

In June, the utility planned to release 300 gallons of highly purified water to members of the Oregon Brew Crew (OBC) for the Pure Water Brew Challenge. The resulting homebrews were scheduled to be judged in August, with the brewer of the winning beer taking home \$100. Kegs of the winning homebrew will be taken to an international water conference in Chicago.

"We need to be judging water by its quality, and not by its history," commented Mark Jockers, a spokesperson for Clean Water Services, which operates four wastewater treatment plants in the Portland suburbs. "The water we're producing is significantly cleaner than what the safe drinking standards are for water that comes out of taps across the United States."

About 25 members of the Oregon Brew Crew are planning to participate in the competition, according to OBC competition committee chairperson Jamie Koty.

Last year, Clean Water Services held a contest in which brewers used treated river water. AHA and Oregon Brew Crew member Ted Assur won the competition with his Vox Max Belgian beer. Assur said he is planning to enter this year's competition, but with a much different style.

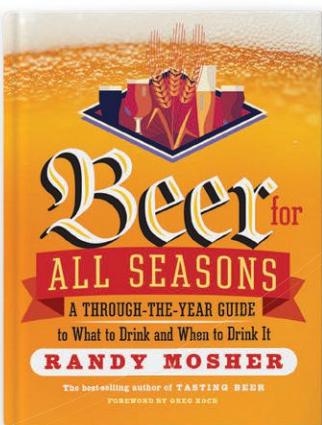


"We're hoping to up the ante on sustainability this year and are asking brewers to use organic, local, and salmon safe ingredients, if possible, in their brews," commented Koty. "We're aiming for beers that showcase the water—brewers will be working with as close to a blank canvas in the water department as we've seen."

The OBC will be partnering with Imperial Organic Yeast (imperialyeast.com), which has agreed to grow and donate yeast for the brewers in the competition.

>> GREAT NEW BOOK

FROM STOREY PUBLISHING
BEER FOR ALL SEASONS
BY RANDY MOSHER



Randy Mosher's newest gem is billed as "a through-the-year guide of what to drink and when to drink it," but it's much more than that. Visually appealing and chock full of fun beer tidbits and education, *Beer for All Seasons* explores festivals, beer history, recipes, suggested beers to drink, and beer and food pairing ideas.

Chapter 4: Summer, for example, has tips for pouring a hefeweizen, suggested homebrews for summer weddings, and tips for beer and barbecue pairings.

Beer for All Seasons, by the author of *Tasting Beer* and *Radical Brewing*, should get you amped up to enjoy the current season of beer drinking and all its peripheral activities. 200 pages, \$14.95.

BEER QUOTE

"We break all the rules. We don't have a microscope; we don't segregate any equipment. We like the artistry—we're not scientists."

—Sante Adairius head brewer Jason Hansen, speaking at the Craft Brewers Conference on the brewery's mixed culture fermentations



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By Gary Glass



18th Annual Big Brew

The 18th annual Big Brew celebration of National Homebrew Day, held May 2, was the biggest ever, with 484 participating sites. Those sites brewed 19,631 gallons of homebrew, with 11,000 homebrewers participating, in 50 states and 14 different countries. Thanks to all of you who took part in this unique, worldwide celebration of homebrewing!

One of the many cool things about Big Brew is how it brings together professional and amateur craft brewers. This year, 88 breweries played host to their local homebrewing communities for Big Brew. Raleigh Brewing Company in Raleigh, N.C. actually brewed one of the three Big Brew recipes alongside local homebrewers and will be serving their version of the beer in their tap room.



Debbie Cerda



Sandy Cockerham



Chip Walton

New AHA Governing Committee Seated

Congratulations to Debbie Cerda, Sandy Cockerham, and Chip Walton on their election to the AHA Governing Committee. Debbie was re-elected and Sandy and Chip are starting their first three-year terms. Thanks to all of the candidates who ran for the Governing Committee this year! Thanks also to the record number of members who voted in this year's election.

My sincere thanks go to outgoing Governing Committee members Denny Conn and Ron Price. Both Denny and Ron not only served the AHA on the Governing Committee, but are also volunteer moderators for the AHA Forum.



(Counterclockwise from top left) The PumpHouse Homebrew Shop and Youngstown Area Homebrewers of Ohio; Big Brew 2015 winners; The Brew Crew; Brewing a Columbus Pale Ale at LoCo in Lansdowne, Va.

Price leaves the Governing Committee to focus on his newly launched brewery Blue Earl Brewing Company in Smyrna, Del. Conn was term limited after nine years of service on the AHA Governing Committee. We will miss them both, but we know they will continue to be involved with the AHA.

The Governing Committee held its annual in-person meeting on June 10 in San Diego, immediately preceding the 2015

National Homebrewers Conference. Members of the Governing Committee also meet via monthly conference calls and communicate by email year-round. Governing Committee members are active on the many subcommittees focused on specific areas of interest to the AHA.

Any AHA members interested in running for election to the Governing Committee can submit nominations this fall for the 2016 election.

Homebrew Club Insurance

Last year, the AHA launched an affordable insurance option for homebrew clubs. Provided through West's Insurance, it gives participating clubs general liability insurance (\$1 million per occurrence, \$3 million aggregate) and liquor liability insurance (also \$1 million per occurrence, \$3 million aggregate) that cover both club meetings and club-sponsored events for up to 1,000 attendees at a cost of just \$3.50 per club member.

Those clubs already enrolled will receive renewal notices directly from West's Insurance. AHA registered clubs wishing to enroll must do so through West's Insurance Agency by the September 1 enrollment deadline. The direct link to the club insurance program can be found in the Community section of HomebrewersAssociation.org.

In addition to the general liability and liquor liability coverage, West's Insurance is now also offering directors and officers insurance policies for homebrew clubs. Those clubs interested in more information on this type of coverage should reach out to West's Insurance.

The AHA spent more than a decade looking for an affordable insurance option for clubs and we are glad to have found one in West's Insurance. The AHA does not receive any financial compensation from

the clubs taking advantage of this coverage—the overall benefit to the homebrewing community is compensation enough.

To find more information on the Club Insurance program, visit the Community section of HomebrewersAssociation.org.



AHA Member Deals

Thanks to the hard work of AHA assistant director Steve Parr and administrative assistant John Moorhead, the AHA Member Deals program now exceeds 1,200 businesses offering discounts to card-carrying AHA members. If you haven't checked out the mobile-friendly AHA Member Deals locator on HomebrewersAssociation.org lately, you may find new discounts available in your area.

CraftWorks, which operates the Gordon Biersch and Rock Bottom brewpubs as well as Old Chicago and other specialty concepts, has more locations than any other Member Deals business. CraftWorks recently consolidated its Member Deals offer to 10 percent off the bill (alcohol where legal) for all of their locations.

Is there a great beer destination in your area that you think should be a part of the AHA Member Deals program? Let us know about it. A form is available in the Membership section of HomebrewersAssociation.org where businesses can let us know they want to participate or AHA members can offer suggestions on locations for the program.

Legislative Update

On April 6, Tennessee Gov. Bill Haslam signed Senate Bill 376/House Bill 859 into law. While homebrewing was legalized in Tennessee in 1989, the existing law was interpreted by some local beer boards as limiting consumption to the home where the beer was made. That interpretation of the law went mostly unknown by Tennessee's homebrewers; however, as homebrewing has become more popular and thus more visible, the risk of enforcement has grown. The existing law also meant that Tennessee was not an option for hosting an AHA National Homebrewers Conference.

AHA member Art Whitaker, founder of the Tennessee Homebrewers Guild, worked with alcohol beverage attorney Craig Mangum (who offered his services pro bono) and the American Homebrewers Association on language for a bill to allow homebrewers to more openly share their homebrews with others. The new law, which went into effect immediately, expressly allows homebrew to be served "for purposes of exhibition, demonstration, judging, tasting, or sampling or as part of a contest or competition" held on licensed premises or private residences. The new law means that homebrewer conferences where a registration fee is charged to attend are now legal and that homebrew may be served at public beer festivals, even if an entry fee is charged.

Whitaker championed this legislation while also serving as the AHA National Homebrew Competition's Nashville judge center site director. Thank you, Art, for being an overachiever for the homebrewing cause!

Until next time, happy homebrewing!

Gary Glass is director of the American Homebrewers Association.



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by Our Readers

Hefeweizen Yeast in Gose?

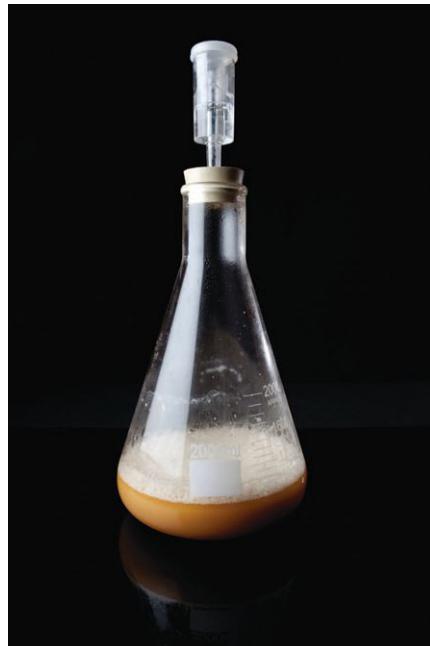
Dear *Zymurgy*,

I have really enjoyed Amahl Turczyn's Style Spotlight series, especially since there are a number of new obscure and historical styles in the updated BJCP guidelines, including gose, the subject of the March/April Style Spotlight. But I cannot understand why he chose a gose recipe that uses a hefeweizen yeast, which is as far as I know completely historically inaccurate for the style. While there are American breweries that use a hefeweizen yeast to brew a "gose" that supposedly tastes similar to a proper gose, I believe that an article about a historical style should at least attempt to use the proper ingredients and techniques. I like experimentation as much as the next homebrewer, but as far as I am concerned, this is a recipe for a salty coriander hefeweizen and not a gose.

Speaking of historical inaccuracies, in that same issue, Drew Beechum (in a section of his article called, ironically, "Pay Attention to History") states that an oaked IPA is "100 percent ahistorical because actual oak beer casks were lined to keep the beer and wood apart." Beer historian Ron Pattinson has written quite convincingly that English beer casks were not lined with pitch (unlike German beer casks). See barclayperkins.blogspot.com/2010/04/lining-casks-with-pitch.html and barclayperkins.blogspot.com/2013/05/casks-in-ww-ii.html and barclayperkins.blogspot.com/2012/12/lining-british-casks.html.

There are a number of beer historians like Pattinson and Martyn Cornell with amazing blogs that have disproved so much of the shoddy beer history that gets repeated over and over again. I hope your editorial team can do more to make sure that false beer history stays out of the pages of *Zymurgy*.

Brian Welch
Holden, Mass.



for all levels of brewing skill, so I have to take ease of brewing into consideration. This often results in an "advanced" and "easy" version of the same recipe, and these may vary in terms of historical accuracy.

Regarding variations on the style by craft breweries, I was intrigued by what Stan Hieronymus wrote:

"Döllnitzer Ritterguts Gose is made under contract for a descendant of the original owners of Rittergutsbrauerei Döllnitzer, the dominant Gose brewery of the nineteenth century. Most drinkers find Ritterguts bolder, more sour, with more coriander and more salt flavor than the Banhof version. [Eric Rose's] Tiny Bubbles tastes more like Ritterguts, and earned a silver medal at the 2010 GABF."

Amahl Turczyn responds: Brian, I'm glad you've enjoyed the Spotlight series. I was unfortunately not of drinking age in 1740, so I can't claim to know exactly what a proper gose tastes like; all we have to go on are historical records, which indicate that most of that period were spontaneously fermented. But gose of that day was a wild thing, delivered to pubs still in the throes of a vigorous ferment, and had to be dealt with quickly and served at the correct time, or it would spoil (acetify). During the late 19th century, as it became big business for breweries, gose evolved into a tamer beast, with brewers adding lactic acid to the boil rather than wrestling with the often temperamental whims of live bacteria. The latter technique seemed more reasonable for modern amateur brewers. My approach was to work backwards from sensory notes and impressions recorded by gose enthusiasts back then, and try to match those up with techniques and ingredients of modern gose brewers today. I do try to make my recipes as historically accurate as possible, but I also try to encourage readers to take them with a grain of salt, as it were—this is a magazine

I'd say that represents a pretty good stylistic endorsement. I therefore concluded that without resorting to spontaneous fermentation (with which, by the way, I have been painfully unsuccessful), a homebrewed version of Rose's gose would be the best combination of Easy to Brew and Historically Accurate. I also happen to like the results I got from this recipe.

However, and this I believe is your core objection, it must be conceded that using hefe yeast as the primary (rather than as a secondary) fermentation strain inevitably leads to greater levels of banana and clove. Rose begins with a lactic culture from Wyeast that he grows up several weeks previous to pitching into the fresh gose wort. This methodology is not far from the fearless spontaneous lactic fermentations of 18th century gose. He then monitors acid levels, and uses the hefe strain to mop up any residual sugars after three or four days of lactic fermentation. That hefe strain has to deal with a really low pH, and I'm guessing it struggles as a result; this is definitely advanced brewing. If this earlier period gose is your target, and you are willing to subject your fer-

mentation and transfer equipment to live lactic cultures like the 18th century brewers, it may fulfill your definition of “proper gose”—but I do not believe this is the best route for most readers, for whom lactic bacteria gone astray in their brewery could have dire consequences for later batches.

So while I feel my version of Döllnitzer represents a low risk, high reward version of the original style, if you find the hefe character too strong, using a clean intermediary strain also works: brew the recipe as stated, then chill and pitch a more neutral strain like an American wheat or German ale yeast. Ferment to 50

percent attenuation, then pitch the hefe yeast. This will lessen the banana and clove while still allowing them to contribute some complexity, and the result may be more to your liking. Or leave out the hefe strain entirely.

In fact, the latter might be an important consideration if you plan to brew this style for a BJCP sanctioned competition—not only would it be best to avoid banana esters, but quite contrary to Hieronymus’ description of “bolder, more sour, with more coriander and more salt,” your gose should in fact be less sour, less salty, and the coriander should only be a hint. This is because the recently updated

style guidelines for gose are based on more modern renditions of the style, like the Banhof version. I consulted BJCP president Gordon Strong on the subject and he replied:

I don’t think I’ve seen anything describing a hefeweizen character. If I were making one, I might use something like a Kölsch yeast unless I was trying for an all lacto fermentation. The best ones I’ve had haven’t been overly acidic, though. I describe it in the guidelines like a squeeze of lemon in iced tea. Likewise, it shouldn’t be like drinking saltwater. It should taste seasoned, not salty. I think too many homebrew versions are way overboard on the coriander, salt, and lacto. The coriander should be giving a light lemony character. But if you overdo all those things, you can’t really taste the underlying beer.

But I don’t like hefeweizens with lemon in them, so I probably wouldn’t want hefeweizen yeast with a lemony, tart beer since it would be like that. Someone entering it in a competition judged with the BJCP guidelines wouldn’t do well with a banana character since that isn’t mentioned.

So there you have it: there are more than a few ways to attack this style. Obviously homebrewers have the freedom to brew beer for their own enjoyment to their own personal taste, but when brewing for competition, one has to mind the guideline specifications. And that’s just the way it gose.

To address the second part of Brian’s letter, Drew Beechum responds: You know the problem with history? It’s constantly changing, especially when you have folks like Ron Pattinson and Martyn Cornell going through and doing the hard work and blowing up the stories, legends, and tales we’ve been told. I’ll freely admit I did not see Ron’s article about unlined British casks, so mea culpa. Instead I slipped back into what I knew when I first created the Bourbon Barrel IPA. Historical accuracy aside, you should brew the beer—it’s dang tasty.

Research & Education Fund

Dear Zymurgy,

I love the magazine and everything you do for homebrewers around the country. I’m proud to be a card-carrying member of the AHA. However, I was disappointed by your response to Matt Monson’s letter

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concerning the Research and Education Fund (REF) [specifically the experiment “Decoction: Worth the Effort?”] in the March/April 2015 *Zymurgy*. I felt as though you misunderstood the point of his letter and addressed it as an attack on beginning brewers, and not as a concern about the validity of the results and how they might affect the credibility of the REF.

In your response to his letter you claim that, “... it remains the duty of the AHA (and by extension the REF) to serve all homebrewer skill levels.” I appreciate and agree with that sentiment, but if the results of an REF funded experiment are invalid due to poor experimental protocol, then the results are useless to all brewers whether they are beginners brewing 5 gallon extract batches on the stove or 20-year veterans brewing 20 gallons at a time on an automated HERMS system.

I’m a big fan of the REF and the potential it has to serve the homebrewing community, but if experiments like this continue to be funded and published, it will decrease the credibility of the entire program, and as Matt said, they won’t be much better than a random forum post on the same subject.

Lucas Sooy
Longmont, Colo.

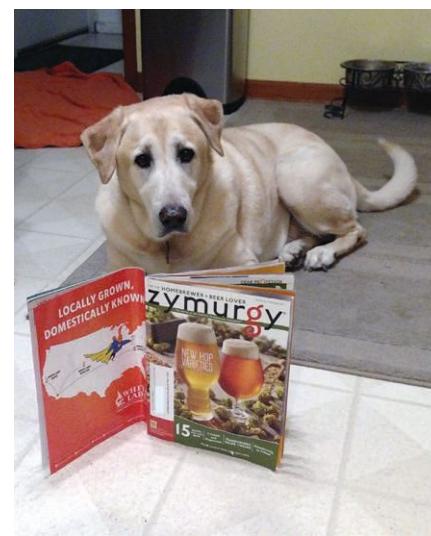
Keep It Simple

Dear *Zymurgy*,
In every magazine that deals with beer recipes, we are bombarded with recipes using multiple malts and several hops—even multiple yeasts in some cases.

How about an article featuring recipes single malts, single hops? Surely there are simple combinations that would produce respectable beers. Have you forgotten the old “K.I.S.S.” principle?

Dave Donovan
Cincinnati, Ohio

Zymurgy editor Jill Redding responds:
Thanks for your note, Dave! Our most recent article on single malt/single hop (SMaSH) beers was Drew Beechum’s “Brewing on the Ones” in the November/December 2013 issue. You can access that article at homebrewersassociation.org/magazine/ezymurgy.



Brew Buddies

Dear *Zymurgy*,

This is my brew buddy Jackson. He's a three-legged (tripawd) cancer survivor who's been with me for every brew day since I started the hobby. Although he's not much help with cleaning equipment, it's hard to keep him away from the spent grain until it's cool enough to eat! I like to think that the half-cup of grain in his nightly meals is one of the reasons he's been around two years longer than his original prognosis; is there anything beer doesn't help? I can't imagine our small apartment/brewhouse without him.

Mike Hrdlicka
Branford, Ct.

Dear *Zymurgy*,

This is my 11-year-old yellow Lab Takoda Joe, making sure he knows the latest beer techniques and news. Takoda also enjoys hanging in the hammock and around the fire pit while I am enjoying the fruits of our labor.

He is a wonderful brew companion.

Jeff Wiegel
Batavia, Ill.

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



READER SUBMITTED HOMEBREW LABEL

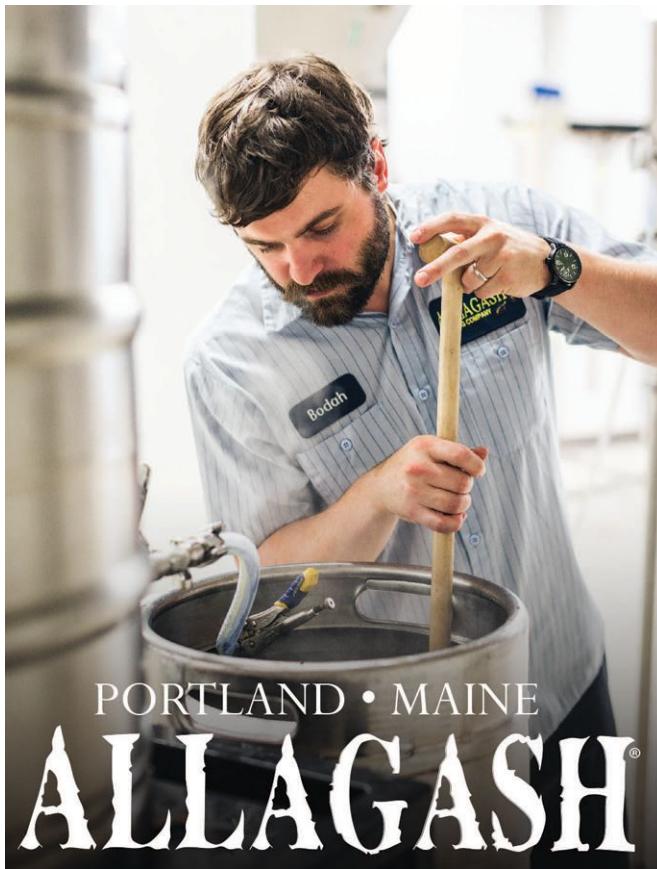
This is me drinking the last drop from an IPA I just bottled. “Good to the Last Hop!”

**Nancy Noll
Arcata, Calif.**

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.



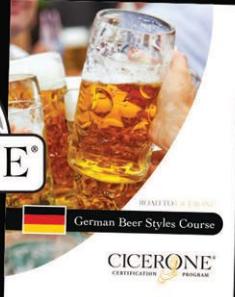
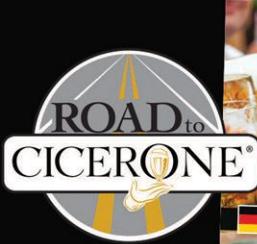


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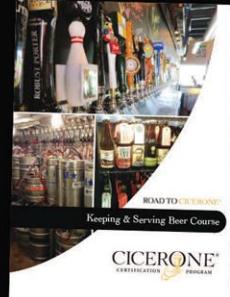
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by Professor Surfeit



Foraging for Fermentables

Dear Professor,

I know you're a fan of prickly pears. As a forager of wild fermentables, I also roam the countryside for plants to turn into alcohol. Two years ago I discovered a large patch of good-looking prickly pears at a campground office. I inquired if I might have them when ripe. After getting a strange look, I explained my purpose, and was granted permission. In November they were ripe, and I picked about 75 pears, which made two gallons of some mighty fine wine.

Last year in late October, I picked 100 pears, which made three gallons of wine. I went back a couple of weeks later and picked another 100. Unsure what to do with them, I cut off the tops and bottoms, then sliced and dried them for future use.

My question: have you ever used them in beer as a fruit adjunct? Since they make a spicy flavored wine, they might work well in pale ale. I would add one pound at the end of the boil to extract flavor and rehydrate them, then rack them off after primary fermentation for a five-gallon batch.

What do you think?

Ralph Bucca
Princess Anne, Md.

Hiya Ralph,

You are indeed a legend in my life—and one of our charter members of the American Homebrewers Association from the very early 1980s. You've contributed a lot of great ideas to Zymurgy columns and were there when the D.C./Maryland area homebrew club BURP was founded. I think we connected after you had found a copy of Charlie Papazian's 1976 edition of *The Joy of Brewing in the Library*



Prickly pears foraged for wine and beer making.

of Congress. It's always a pleasure to hear from you and your innovative approaches to brewing and fermenting.

What do I think? I think it's a great idea, especially the idea of sliced dried fruit. I usually bag and freeze my fruit in expectation that I'd be using it within a year to make prickly pear mead. But slicing and drying might not only extend the life of the fruit, but also create some interesting dried fruit flavors that would be especially fine in certain styles of beer. The creative side of me might suggest a strong, not so hoppy, English-style barleywine or Belgian-style tripel or strong ale with 3 pounds of frozen-thawed prickly pears or the equivalent of dried prickly pears (maybe about 1 pound of dried?). What do you think? One pound of dried pears equals about 4 pounds of fresh prickly fruit?



Yep, I'd put them in the last 10 to 15 minutes of the boil. I'd also note that it's likely to make the wort viscous and run gooey, but all that dissipates with fermentation. I think your idea of using dried prickly pear rather than the fresh or frozen state is a winner of an idea.

Please let me know how it turns out and save me a bottle for the next time I'm in the D.C. area.

Not so prickly idea,
The Professor, Hb.D.



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A Celestial Brew

Dear Professor,

In the search for a less expensive beer to brew (my wife was none too happy when my last jolly creation hovered around the \$75 mark), I decided to fall back upon the trusty *Complete Joy of Homebrewing* for ideas and recipes. I stumbled upon Charlie Papazian's recipe for Roastaroma Deadline Delight. Since I prefer extract brews due to limited time and space, I thought this would be a wonderful ale to experiment with in the brew kettle. Also, since Boulder is only 40 minutes away, I figured that a tour of Celestial Seasonings would be a fun way to get the key ingredient.

My question is that since the tea is in bags, how do I go about getting 2 ounces of tea? Is this 2 ounces of bagged tea or am I to cut open the bags? If need be, can I get away with using the teabags in the kettle, and how many bags should I use?

Not bagging it,
Josh Woeber

Dear Josh,

As you discovered, Celestial Seasonings Roastaroma® tea is no longer available as loose tea. It is only available in single serve tea bags. That's disappointing, isn't it? The ingredients are: roasted barley, roasted chicory, roasted carob, cinnamon, allspice, and Chinese star anise. But of course I don't know the proportions, though often they are listed in order of weight. That leaves you with two options. One, buy a couple boxes and cut the bags open. That should get you a bit more than the two ounces of loose tea required for the 5 gallon (19 L) recipe. The second option is to try to mix your own blend. If I were to take a guess, this is what I'd blend for a 2 oz (56 g) dose:

	grams	Percentage by weight
roasted barley	22	39.3%
roasted chicory	13	23.2%
roasted carob	10	17.9%
cinnamon	4	7.1%
allspice	3	5.4%
Chinese star anise	4	7.1%
Total weight	56	100%

Charlie Papazian recently published the fourth edition of *The Complete Joy of Homebrewing*. It's worth noting that the Roastaroma® Deadline Delight recipe has

been omitted in this newer edition and replaced with another of his favorite recipes. However, a 2015 version appears in his *World of Worts* column on page 85.

It's a great beer that was very popular in its day. Perhaps you will help it make its return to popularity.

Celestially,
The Professor, Hb.D.

Send your letters to professor@brewersassociation.org.



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By Amahl Turczyn

Sahti

Sahti is an ancient, rustic style of beer from Finland that is still brewed there today, much as it was back in the late 1400s and early 1500s. It was not meant to travel; very much a local beer, it was brewed by the lower classes in small towns for visitors and for festivals. As with other early European beers, each town had its own slight variation on the style that it proclaimed was superior to the Sahti from the next town down the road. The beer was brewed at inns and farms by peasants, who passed the knowledge of their trade, along with their brewing equipment, to younger generations.

While most Sahti was brewed to a formidable alcoholic strength—original gravities started at around 1.075 (18° P) and rose to 1.110 (26° P) and beyond for the beer made for festivals—it was not a keeping beer. Rich and turbid, Sahti was usually not allowed to reach a boil during the brewing process, so it contained high levels of protein haze, suspended yeast, and even active enzymes. This meant it spoiled rapidly, so it was important to drink it very soon after it was made.

Commercial efforts to brew and bottle Sahti have had varying degrees of success, but it really is best fresh—perhaps only a week or two after terminal gravity is reached is necessary to settle out some of the suspended solids. To this day, it's not uncommon to find it served directly from the fermenter. Fortunately, this also means it is the perfect style for brewing at home, and while some of the more traditional specialized equipment would be difficult to obtain, it is easily adapted to home brewery equipment. Another nice thing about Sahti is that slight variations in ingredients, strength, and brewing methodology are part of the style's history. There are guidelines as to how it should be made, but there is some leeway as well; so while we



can offer a recipe that is historically accurate, there is also some room for creative interpretation, particularly in the grain bill.

Ingredients

Sahti has for centuries been brewed in the forests, and that character remains an intrinsic part of the beer. Kettles were heated over open wood fires, lautering vessels called *kuurnas* were actually made from hollowed-out aspen logs (though modern brewers build them from wooden planks), and the grain itself is mashed separately, then ladled over fresh juniper twigs in the *kuurna*, which aids in mash filtration. All this contact with unlined wood, wood smoke, branches, evergreen foliage, and sap forms an essential part of the finished beer's character, as it does with spruce beer. There are in fact some striking similarities in the resinous, wintergreen aromatics and spicy, tannic flavors, though Sahti is nearly always a stronger, even cloudier brew.

Yeast is another element that shapes the aroma, flavor, and strength of Sahti, and unfortunately, it's probably the most difficult piece of this puzzle to find for a com-

pletely authentic recreation of the beer. That's because the yeast used in Finland is a type of fresh baker's yeast. It isn't 100 percent suited to brewing use, because it produces strong esters (particularly isoamyl acetate, the same banana-like notes found in hefeweizen, but even stronger) and phenols (the most intense of which is clove-like 4-vinyl guaiacol, again found in hefeweizen). The yeast also tends to stay in suspension rather than drop out, which adds cloudiness to an already turbid, protein-rich, and tannin-rich beer.

In that it's fresh yeast and not freeze-dried, though, it's not something North American brewers can easily find unless they have Finnish friends or relatives who are willing to send them a few cubes of the soft, perishable stuff. It's very common to find there, as nearly every corner market carries it, but it isn't something you can mail order if you live outside Finland. Some craft brewers outside Finland have circumvented the problem by using a blend of available yeasts, including hefeweizen strains for the signature banana and clove, but there are some idiosyncrasies to the original bread yeast that contribute much more than those flavors to a stylistically accurate Sahti. For one thing, the low-flocculent yeast has a better chance at very thorough attenuation, which is especially important for the festival-strength versions of Sahti. The yeast stays in the beer longer, and produces a drier, more alcoholic result, which can go a long way in balancing this traditionally unhopped ale. Full-bodied and either completely uncarbonated or very lightly fizzy, this is a beer that's hard to get down if it's too sweet. This is where active enzymes during fermentation can be helpful.

When enzymatic activity is allowed to continue during fermentation, any remaining starches will continue to break down into



Sahti

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

13.25 lb	(6 kg) German Pilsner malt
2.0 lb	(0.9 kg) dark rye malt
1.0 lb	(0.45 kg) 120° L crystal malt
4-6	fresh juniper branches (about 12" each) for lautering
Finnish baker's yeast	(fresh) or use fresh Red Star baker's yeast
Water	reverse-osmosis filtered (or activated charcoal filtered) water

Original Gravity: 1.080 (19.25° P)

Final Gravity: 1.016 (4° P)

IBUs: 0

SRM: 13

ABV: 8.6%

Boil Time: 0 minutes

Assumed Brewhouse Efficiency: 75%

DIRECTIONS

See text.

PARTIAL EXTRACT VERSION: Due to the mash process specific to brewing Sahti, an extract version is not recommended. I make no claims that the following would stand as an approximation of the all-grain recipe, but for a partial extract recipe: Mash 4 lb (1.81 kg) Pilsner malt with the rye and crystal malts at 150° F (66° C) for one hour with three or four juniper branches in the mash. Strain, rinse grains with hot water, and dissolve 7.25 lb (1.93 kg) pale malt extract syrup into the wort. Dilute to desired boil volume. Boil 15 minutes, remove from heat, and add remaining juniper boughs. Allow to steep five minutes, remove branches, chill wort, and proceed as above.

simple sugars for the yeast to turn to alcohol (albeit slowly, given the temperature range). If this seems oddly familiar, you may have heard of something similar in the making of Japanese sake: it's called parallel fermentation, and at least in the case of sake, it helps the yeast attain astoundingly high alcohol tolerances, often in excess of 20 percent by volume. Since enzymes are converting starches to sugars at the same time yeast is converting sugars to alcohol, that yeast is somehow able to achieve a much higher tolerance. Sahti with sake yeast might be an interesting experiment.

Another reason fresh Finnish baker's yeast contributes directly to "authentic" Sahti character is the speed at which it ferments. Sources say that once hydrated with a small volume of cooled wort, primary fermentation can take place extremely rapidly: the gravity can drop 60 points, or 15° P, in less than 48 hours. This also generates a huge amount of heat. Without temperature control during fermentation (which is something no one knew to worry about in the 1500s), the primary temperature can shoot from a 68° F (20° C) baseline to over 100° F (38° C) at high krausen. This kind of heat would be a bit rough on most ale yeast strains, but it would have the advantage of encouraging further enzymatic activity, and bread yeast, by comparison, seems to tolerate it pretty well. Even so, you can imagine the host of esters and phenols generated at such temperatures. This kind of free-rise technique is rarely seen in other beer styles, though it is sometimes used for brewing saison—perhaps then a Belgian saison strain would be worth trying in Sahti. When the mountain of foam finally subsides, Sahti is typically given another week in secondary at cool cellar temperatures to finish out.

Some North American Sahti brewers have apparently had good results using Red Star fresh (not dried) baker's yeast; the results aren't exactly the same as with Finnish *Suomen Hiiva*, but may be worth trying.

For the grain bill, pale or Pilsner malt can be used for Sahti (~80 percent), along with dark rye malt (~10 percent), crystal (~5 percent) and/or Munich malt (~20 percent). You can't make proper Sahti without juniper branches, but the grain bill can see

Festival Sahti

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

15.0 lb	(6.8 kg) German Pilsner malt
3.75 lb	(1.7 kg) 20° L Munich malt
4-6	fresh juniper branches (about 12" each) for lautering
Finnish baker's yeast	(fresh) or use fresh Red Star baker's yeast
Water	reverse-osmosis filtered (or activated charcoal filtered) water

Original Gravity: 1.095 (22.75° P)

Final Gravity: 1.016 (4° P)

IBUs: 0

SRM: 10

ABV: 10.4%

Boil Time: 0 minutes

Assumed Brewhouse Efficiency: 75%

DIRECTIONS

See text.



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a bit more variation. Rye malt works very well with the juniper flavors, as it seems to enhance the wintergreen essence, but too much can slow or stick the mash. Crystal malt can add too much heft and sweetness, but darker types (even Special B) in lesser proportions can work well. Perfectly good Sahti can be made with 20 percent dark Munich and 80 percent pale two-row or Pils malt only. Pilsner malt is most commonly used as a base malt for Sahti today, and if that's your choice, I recommend a step infusion mash with a protein rest (though this beer is probably going to contain a good deal of protein regardless). Two-row pale is better for single infusion mashing.

Hops rarely if ever made up a significant part of this beer, but if you must, a symbolic handful can be added to the mash.

Water for Sahti was generally soft, so don't worry about salt or mineral additions. With such a high gravity beer, the yeast will get all it needs from the grain bill.

Sourcing juniper might be a problem, depending upon where you live, but its presence in the mash is an inseparable part of the aroma, flavor, and palate of the style. Check around, though; it is very commonly used in housing areas as a landscaping shrub. Pick the freshest, cleanest boughs you can find, and if possible, wait until brew day to harvest them. It is good practice, and completely traditional, to immerse the juniper boughs in your hot liquor tank before

mashing in. This helps to sanitize them, and any juniper essence extracted into the hot water remains part of the beer.

Mashing and Sparging

It is of course possible for homebrewers to mash and lauter in the same vessel, but traditionally these were done separately. Straw was used at the base of the *kuurna* to allow wort to flow beneath the grain bed, though many modern Sahti brewers use metal screen, like a homebrew mash tun's false bottom. Fresh juniper boughs are cut and placed over the screen, and the converted mash is transferred to the lautering vessel. There, wort is infused with juniper essence as the sweet wort is allowed to run out into a kettle to then be chilled. Fly sparging of the remaining grain bed can then commence, depending upon how strong you want your Sahti, but make sure the first Sahti runnings aren't diluted past 1.080. Thrifty brewers may see an excellent opportunity to make a small beer (*jällkjuoma*) from the remaining sugars in the mash after the strong beer (*tupulishti*) is run off; you may choose to supplement this second wort with sugar, as is often done by Sahti brewers; or use malt extract.

Sahti brewers used one of two mash schedules: step infusion or single infusion. Let's look at the single schedule first, as it is the easiest. Target a mash temperature that results in high fermentability—149° F (65° C)—and insulate the tun well for the one-hour duration of the mash. Some

Sahti brewers used a wooden mash tun, which was further insulated with thick layers of hay. This mash method works best with a high diastatic power base malt that doesn't require a protein rest.

For the step infusion mash schedule, if you are using hot water for each infusion, dough in very dry at 122° F (50° C) for 20 minutes. Follow this with a beta amylase rest at 149° F (65° C) for 45 minutes, and an alpha amylase rest at 158° F (70° C) for 30 minutes. Ancient brewers of the style learned these temperature ranges as part of their brewers' training, and were apparently able to recognize and maintain them with startling accuracy, without the use of a thermometer. But using this method, it's very easy to mash in too wet, then run out of room in your mash tun at the third infusion, especially with the voluminous amount of malt needed to achieve such a high starting gravity.

Modern Sahti brewers use a kettle to mash rather than a wooden vessel, and that allows them to heat the mash directly over a wood fire, burning enough kindling to hit each rest temperature in succession. With this method, you'll want to dough in with considerably more water, and of course, stir the mash thoroughly to distribute the heat and avoid scorching.

Regardless of mash schedule, sources differ on mash-out practice. As modern brewers, most of us would obviously prefer to give the mash a final boil, decoction-style, just to sterilize the brew before runoff, cooling and fermentation, and to halt enzymatic activity. (And as with a decoction, pH buffering means you don't have to worry about extracting harshness when boiling the grain.) This was not always done, but is perfectly acceptable and in accordance with Sahti brewing tradition. To get the mash to boil, some Sahti brewers used superheated rocks added carefully one by one, much as German *steinbier* brewers used them to boil wort. The same caramelization of malt sugars on the stones happens with this method, and adds a distinctive flavor to Sahti brewed this way. Direct-fired kettle mashers simply burn more wood until the mash boils.

Once the mash is complete, you'll want to do a thorough recirculation of the wort



before runoff. It may not clear much, but the vorlauf is definitely a step you don't want to skip.

While it is not strictly traditional, home-brewers may be tempted to then run the vorlaufed wort into a kettle, and do a quick (10 to 15 minute) boil before chilling. This will certainly result in a cleaner, clearer brew, since some of the proteins will have time to form break and fall out of suspension. But this was not normally done in Finland, then or now.

Even the final boil of the mash was not always done—some brewers had reason to keep the enzymes going, as stated above, and without ever exceeding the high 150s, the beer was run off to be chilled and fermented.

Chill your wort, and when it gets below 70° F (21° C) draw off a liter or so into a sanitized vessel as a starter and pitch a quarter of a cube of fresh baker's yeast. It may not seem like much, but trust me, it will do the trick. Continue to chill the main batch to a starting fermentation temperature of 68° F (20° C). When foam begins to rise from the starter (and this should only take 20 or 30 minutes) it's time to pitch the starter into the main batch. Take every precaution you can against a violently foamy blowout, and if you want to do things traditionally, allow the temperature to free rise as high as it wants. After primary fermentation, usually not more than two or three days, the foam should begin to drop back down into the beer. Commence secondary fermentation by moving the fermenter to a basement, cellar, or other cool area with ambient temperatures in the high 50s to low 60s (13 to 18° C). After a week, rack and package.

Resources

1. Sysila, Ilkka. "Sahti – A Remnant of Finland's Past." *Brewing Techniques*. 1998. morebeer.com/brewingtechniques/library/styles/6_4style.html
2. Agnew, Michael and Mark Roberts. "Brewing TV, Episode 24: Sahti Throwdown." brewingtv.com
3. Kanerva, Lauri, via email.

Amahl Turczyn is associate editor of *Zymurgy*.





The Results Are In!

By Jill Redding

Three observations from this year's Best Beers in America poll:

AHA members love hops.

AHA members love beer.

AHA members love hoppy beer.

With more than 3,500 breweries now operating in the United States and countless new beers being introduced on a daily basis, AHA members have a tall task when it comes to choosing the Best Beers in America. With voters able to list up to 20 of their favorite commercial beers available for purchase in the United States, we received more than 19,000 votes for more than 5,900 different beers from 1,763 breweries.

One thing is certain in this year's poll: hops are still tops for AHA members. Of the top 10 beers, nine are IPAs, double IPAs, or pale ales—with a double chocolate oatmeal coffee stout thrown in for good measure.

"America was raised on sweets, so for a bitter beer style to be so popular is amazing to me," said Russian River Brewing Co. owner and brewmaster Vinnie Cilurzo. "When I first started making Blind Pig in 1994, I knew of maybe four other IPAs in America. I never thought IPA would be the top style."

Cilurzo probably never imagined that another one of his creations, Pliny the Elder, a double IPA, would be *Zymurgy*'s Best Beer in America for seven straight years, either.

"I say it every year, but we really are honored and humbled," said Cilurzo. "There are so many great beers out there."



THE TOP 10 ...

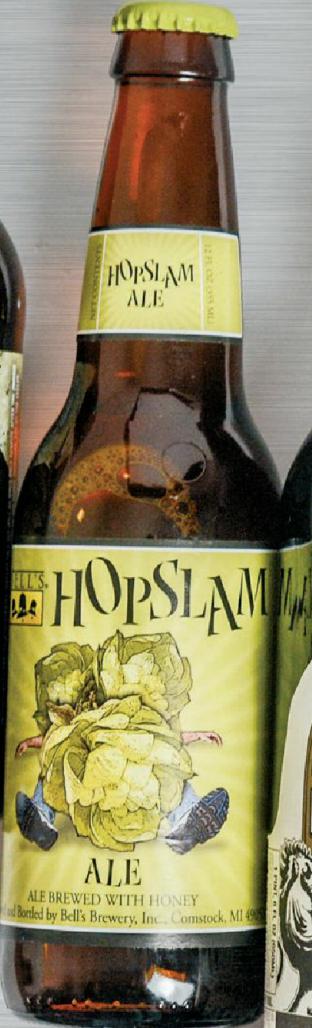
7

Bell's
Hopslam Ale



8

Three Floyds
Zombie Dust



7

Bell's
Hopslam Ale



10

Firestone Walker
Wookey Jack

5

Founders
Breakfast Stout



1

Russian River
Pliny the Elder



3

Ballast Point
Sculpin IPA



9

Dogfish Head
90 Minute IPA



4

Stone
Enjoy By IPA



2

Bell's
Two Hearted Ale



6

The Alchemist
Heady Topper

... AND THE REST OF THE BEST >>



THE KING OF HOPS

Pliny the Elder's elusiveness—the beer is available only in northern and southern California, Oregon, Colorado, and Philadelphia, and about 50 percent of production goes directly to the brewpub—only adds to its cult status.

Vinnie and Natalie Cilurzo tell stories of people coming from around the world to their brewpub in Santa Rosa, Calif., to drink Pliny the Elder.

"We ask them, 'Do you like hoppy beer?'" says Natalie. "They say 'No.' They drink it anyway, just to say they've had Pliny the Elder."

"It's one of the first, and still one of the best, double IPAs," commented AHA member Chris Burgess of Rocklin, Calif. "Because everyone wants it, it's always fresh. The hop flavor and bitterness is perfectly balanced. For a double IPA, it's nuanced, not just a 'dump in a ton of hops' beer. It's also far too sessionable than a double IPA should be...which is both good and bad."

Vinnie Cilurzo recommends a shelf life of "under a month" for Pliny, "But it can go two months or even three months," he said. While Cilurzo has mentioned in the past that the recipe for Pliny the Elder is occasionally tweaked, the recipe hasn't changed in quite a while; his focus these days is on perfecting the process for shelf and flavor stability. "I'm obsessed with dissolved oxygen," he said.

THE BEST OF THE REST

For the sixth straight year, Two Hearted Ale, an IPA from Bell's Brewery in Kalamazoo, Mich., was the runner-up in the poll. The beer, which showcases Centennial hops, is "an essay in balance," according to AHA member Derek Zomonski of Kalamazoo. "I believe a world-class beer is made on the second pint—when you not only enjoy the second pint but are also looking forward to it, it makes for an incredible beer."

TOP-RANKED BEERS

(T indicates Tie)

1. Russian River Pliny the Elder*
2. Bell's Two Hearted Ale*
3. Ballast Point Sculpin IPA
4. Stone Enjoy By IPA
5. Founders Breakfast Stout
6. The Alchemist Heady Topper
7. Bell's Hopslam Ale
8. Three Floyds Zombie Dust
9. Dogfish Head 90 Minute IPA*
10. Firestone Walker Wookey Jack*
11. Deschutes Fresh Squeezed IPA
- T12. Left Hand Milk Stout Nitro
- T12. Sierra Nevada Pale Ale
- T12. Sierra Nevada Torpedo Extra IPA
15. Goose Island Bourbon County Stout
16. Russian River Blind Pig I.P.A.
- T17. Arrogant Bastard Ale
- T17. Founders KBS
- T19. Russian River Consecration
- T19. Russian River Supplication
21. Deschutes Black Butte Porter*
- T22. Firestone Walker Parabola
- T22. Firestone Walker Union Jack
- T24. Firestone Walker Double Jack
- T24. Odell IPA
- T24. Tröegs Nugget Nectar
27. Founders All Day IPA
- T28. Dogfish Head 120 Minute IPA
- T28. Sierra Nevada Celebration
30. Lagunitas IPA
31. North Coast Old Rasputin
32. Lagunitas Little Sumpin' Sumpin'
- T33. Ballast Point Grapefruit Sculpin
- T33. Boulevard Tank 7 Farmhouse Ale
35. Surly Furious
36. Stone Ruination IPA
37. Deschutes The Abyss
38. Green Flash West Coast IPA
39. Oskar Blues Ten FIDY
40. Cigar City Jai Alai
- T41. Great Lakes Edmund Fitzgerald Porter
- T41. New Belgium La Folie
43. Oskar Blues Dale's Pale Ale
44. Founders Backwoods Bastard
- T45. Victory DirtWolf Double IPA
- T45. Fat Head's Head Hunter
- T45. Lagunitas Sucks
- T45. Stone IPA
- T49. Odell Myrcenary
- T49. Russian River Pliny the Younger
- T49. Ballast Point Victory at Sea

* Clone this beer at home! Find the recipe on our website @ HomebrewersAssociation.org/clones



Find a clone recipe for Pliny the Elder on our website @ HomebrewersAssociation.org/pliny15

For the second straight year, Ballast Point Sculpin IPA was third. A two-time gold medal winner in the World Beer Cup for the San Diego brewery, Sculpin IPA has notes of apricot, peach, mango, and lemon.

"This beer has all the characteristics I enjoy in a West Coast IPA or any IPA, for that matter," commented Gary Baxley of Louisville, Colo. "It has an excellent nose, taste, and mouthfeel. It is an exceptional beer."

Finishing fourth was Enjoy By IPA from Stone Brewing Co. in Escondido, Calif. The meant-to-be-consumed-fresh double IPA burst onto the scene in late 2012, with six releases of the beer planned for 2015.

"There's nothing like the hop explosion this beer provides," commented Paul Norconk of Monrovia, Calif.

Stone Brewing Co. brewmaster Mitch Steele said the only thing different about the six releases this year is the enjoy-by date on the label. "We changed the hop recipe a lot in its first year, but really haven't changed it significantly since fall 2013," he said. "We've always tried to maintain the same flavor profile throughout any of the changes."

Founders Breakfast Stout crashed the hop-heads' party by finishing fifth in the poll. Brewed with flaked oats, bitter and imported chocolate, and two kinds of coffee, Breakfast Stout is a late fall seasonal for Founders Brewing Co. in Grand Rapids, Mich.

"This is my go-to beer," revealed Christopher Howard of Lafayette, Pa. "It has the perfect balance of malt, hops, body, and flavor."

Of course, with all of the choices these days, narrowing a Best Beers list down to 20 is getting increasingly difficult.

"So many good beers, so little time," lamented Steve Brothers of New Palestine, Ind. "Way too many to mention."



BREWERY RANKINGS

(T indicates Tie)

1. Russian River Brewing Company,
Santa Rosa, Calif.
2. Stone Brewing Co.,
Escondido, Calif.
3. Bell's Brewery, Inc.,
Kalamazoo, Mich.
4. Founders Brewing Co.,
Grand Rapids, Mich.
5. Firestone Walker Brewing Company,
Paso Robles, Calif.
6. Sierra Nevada Brewing Co.,
Chico, Calif. and Mills River, N.C.
7. Dogfish Head Craft Brewery,
Milton, Del.
8. Lagunitas Brewing Company,
Petaluma, Calif. and Chicago, Ill.
9. Ballast Point Brewing,
San Diego, Calif.
10. Deschutes Brewery,
Bend, Ore.
11. New Belgium Brewing,
Fort Collins, Colo.
12. Avery Brewing Co.,
Boulder, Colo.
13. Odell Brewing Co.,
Fort Collins, Colo.
14. Three Floyds Brewing Co.,
Munster, Ind.
15. Oskar Blues Brewery,
Longmont, Colo.
16. Goose Island Beer Co.,
Chicago, Ill.
17. New Glarus Brewing Co.,
New Glarus, Wis.
18. Surly Brewing Co.,
Minneapolis, Minn.
19. Tröegs Brewing Company,
Hershey, Pa.
20. The Bruery,
Placentia, Calif.
21. Green Flash Brewing Co.,
San Diego, Calif.
22. The Boston Beer Company,
Boston, Mass.
- T23. Great Divide Brewing Co.,
Denver, Colo.
- T23. Cigar City Brewing,
Tampa, Fla.
25. Victory Brewing
Company, Downingtown, Pa.

"With the ever-evolving selection of craft brews available to consumers, browsing the local liquor store's beer shelves has become a strangely satisfying social event with fellow beer geeks," commented Hans Muecke of Aurora, Ill.

AHEAD OF THE PACK

As in years past, we also kept track of which breweries received the most votes in the poll. For the second straight year, the number one brewery is Russian River, which placed five beers in the top 50.

Russian River has had a pivotal year, installing a new brewhouse at its production facility and turning to a good friend in the craft brewing industry—Matt Brynildson at Firestone Walker Brewing Co.—to brew Pliny the Elder during that timeframe.

"We were stressed about being shut down [production-wise] and knew we'd run out of Pliny at the pub," said Natalie Cilurzo. "We couldn't even finish the question [to Matt] when he said yes. Our friend helped us when we needed help."

Vinnie went to Paso Robles for a few of the early brews with Firestone Walker's crew to get it dialed in, but, "By the second brew, it tasted just like Russian River Pliny," he said. "Plus, we got to make Pliny on a frickin' Ferrari after we'd been brewing it on our broken down '60s VW bus."

"We knew we were in good hands," he added. "It made me proud to be a part of this industry."

Finishing second among breweries was Stone Brewing Co., which had four beers in the top 50: Stone Enjoy By IPA, Arrogant Bastard, Stone Ruination IPA, and Stone IPA.

As far as Best Portfolio, Sierra Nevada Brewing Co. was the top brewery with an impressive 60 beers receiving votes in the poll. In early 2015, Sierra Nevada debuted Hop Hunter IPA, which uses oil

“IT IS EXTREMELY

GRATIFYING TO LEARN

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COMMUNITY ENJOY

OUR BEERS.”

—Mitch Steele,
Stone Brewing Co. brewmaster

from wet hops distilled in the field minutes after harvest to inject a fresh harvest flavor into the beer, and also introduced Nooner Pilsner to its year-round lineup.

Stone Brewing Co. also finished second in the Portfolio division, with 54 beers mentioned.

"It is extremely gratifying to learn that so many members of the homebrewing community enjoy our beers," said Steele. "Most of the Stone Brew Crew started out as homebrewers and a large percentage of us still homebrew. Having our beers recognized in this way means so much to us, and we continue to gain inspiration from the collective creativity of homebrewers everywhere."

O CANADA

As has been the recent trend, no beers produced by breweries outside of the U.S. made the top 50—but one came darned close. La Fin du Monde, a triple brewed by Quebec, Canada brewery Unibroue, finished just outside the top 50 and was the top import for the second straight year.



Sierra Nevada Brewing Co. taproom in Mills River, N.C.

Dr. Harvey Raben of Austin, Texas called La Fin du Monde "an exhilarating combination of perfect grain sweetness with yeast spice that satisfies every time without being too heavy."

For the second straight year, Abt 12, a Belgian quad brewed by St. Bernardus brewery in Watou, Belgium, placed second.

"This beer haunts my dreams," commented Michael Rich of Elmira, N.Y. "A malty, heavy, complex beer that I just can't get enough of. It drinks like a fine wine, and paired with any meal it is the equalizer that brings everything together."

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 Deschutes Fresh Squeezed IPA and Lagunitas Little Sumpin' Sumpin'. (More clone recipes can be found in Amahl's feature on page 32). 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 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 of the AHA members who voted in this year's poll, and for your insightful comments that helped tell the story of why you love the beers on your list. It's time to start doing some taste testing for the 2016 Best Beers in America poll. Go!

Jill Redding is editor-in-chief of Zymurgy.

BEST PORTFOLIO

(T indicates Tie)

- | | |
|---------------------------------------------------|---------------------------------------------------------------------|
| 1. Sierra Nevada Brewing Co.,
60 beers | T6. Dogfish Head Craft Brewery,
37 beers |
| 2. Stone Brewing Co.,
54 beers | T8. Firestone Walker Brewing Company,
35 beers |
| 3. Bell's Brewery, Inc.,
52 beers | T8. The Boston Beer Company
(Samuel Adams),
35 beers |
| 4. New Belgium Brewing,
47 beers | T8. The Bruery,
35 beers |
| 5. Avery Brewing Co.,
39 beers | |
| T6. Goose Island Beer Co.,
37 beers | |

Deschutes Fresh Squeezed IPA Clone

Recipe by Amahl Turczyn

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

11.0 lb	(4.99 kg) U.S. pale two-row malt
1.75 lb	(0.79 kg) 10° L Munich malt
0.75 lb	(340 g) 75° L crystal malt
0.5 oz	(14 g) Nugget pellets, 13% a.a. (60 min)
1.0 oz	(28 g) Citra pellets, 12% a.a. (15 min)
1.0 oz	(28 g) Mosaic pellets, 12% a.a. (15 min)
1.0 oz	(28 g) Citra pellets, 12% a.a. (steep 10 min)
1.0 oz	(28 g) Citra pellets, 12% a.a. (dry hop 5 days)
1.0 oz	(28 g) Mosaic pellets, 12% a.a. (dry hop 5 days)

White Labs WLP001 California Ale yeast
Whirlfloc (10 min)

Original Gravity: 1.066

Final Gravity: 1.014

SRM: 9.4

IBU: 60 (Tinseth)

ABV: 7%

Boil Time: 90 minutes

Assumed Efficiency: 75%



DIRECTIONS

Use 1g/gallon gypsum to treat distilled or RO water. Mash grains at 150° F (66° C) for one hour. Steep flameout hops for 10 minutes before chilling. Pitch cooled wort at 67° F (19° C) and allow temperature to rise naturally to 70° F (21° C). When fermentation is complete, dry hop in primary fermenter for five days. Drink it as fresh as possible (~2-3 weeks after packaging) for maximum late hop character.

PARTIAL MASH VERSION: Substitute 8.25 lb (3.74 kg) pale malt extract syrup for the pale two-row. Mash Munich and crystal malts at 155° F (68° C) for 40 minutes, or until Munich malt reaches conversion. Drain, rinse, and dissolve extract completely before proceeding with boil.



Lagunitas Little Sumpin' Sumpin' Clone

Recipe by Amahl Turczyn

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

7.0 lb	(3.18 kg) two-row pale malt
5.0 lb	(2.27 kg) white wheat malt
1.75 lb	(0.79 kg) torrified wheat
1.0 lb	(0.45 kg) rice hulls (in mash, optional)
3.0 oz	(85 g) caramel wheat malt
0.75 oz	(21 g) Nugget, 13% a.a. (60 min)
0.25 oz	(7 g) Willamette, 5.5% a.a. (30 min)
0.25 oz	(7 g) Willamette, 5.5% a.a. (15 min)
1.0 oz	(28 g) Santiam, 6% a.a. (15 min)
0.75 oz	Amarillo, 8.5% a.a. (dry hop 5 days)
0.75 oz	Cascade, 5.5% a.a. (dry hop 5 days)
0.75 oz	Centennial, 10% a.a. (dry hop 5 days)
0.75 oz	Chinook, 13% a.a. (dry hop 5 days)
0.75 oz	CTZ, 14% a.a. (dry hop 5 days)

White Labs WLP007 Dry English ale yeast

Whirlfloc (15 min)



TOP IMPORTS

(T indicates Tie)

1. Unibroue La Fin du Monde (Canada)
2. St. Bernardus Abt 12 (Belgium)
3. Rodenbach Grand Cru (Belgium)
4. Guinness Draught (Ireland)
5. Saison Dupont (Belgium)
- T6. Orval (Belgium)
- T6. Chimay Grande Réserve/Blue Label (Belgium)
8. Samuel Smith Oatmeal Stout (England)
- T9. Weihenstephan Hefeweissbier (Germany)
- T9. Cantillon Gueuze (Belgium)

Original Gravity: 1.071

Final Gravity: 1.015

SRM: 5

IBU: 40 (Tinseth)

ABV: 7.5%

Boil Time: 90 minutes



DIRECTIONS

Use 1g/gallon gypsum to treat distilled or RO water. Mash with rice hulls to aid with lautering if desired. Use a single infusion mash at 150° F (66° C), no mash out. Ferment at 67° F (19° C). Dry hop five days in primary. Filter if you have the means; fine with gelatin in secondary if you don't. Drink it as fresh as possible (~2-3 weeks after packaging) for maximum dry hop character.

EXTRACT VERSION: Substitute 3.9 lb (1.77 kg) pale malt extract syrup for the two-row pale and 7 lb wheat malt extract syrup for the wheat malt, torrified wheat, and caramel wheat. Note that extract recipe will be slightly darker (9 SRM) than all-grain version.

Gotta-Brew.com

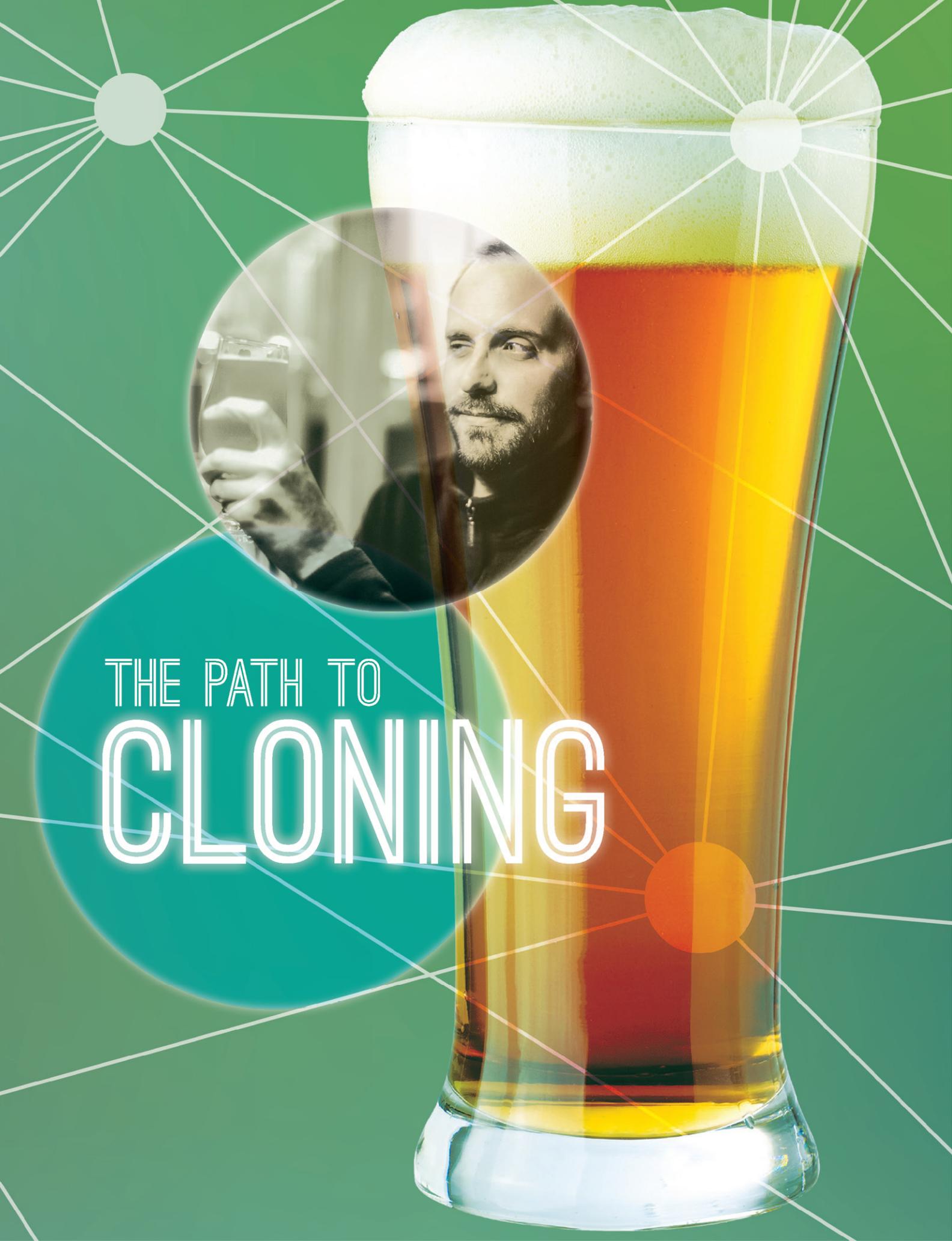
Fermentation Temperature Control



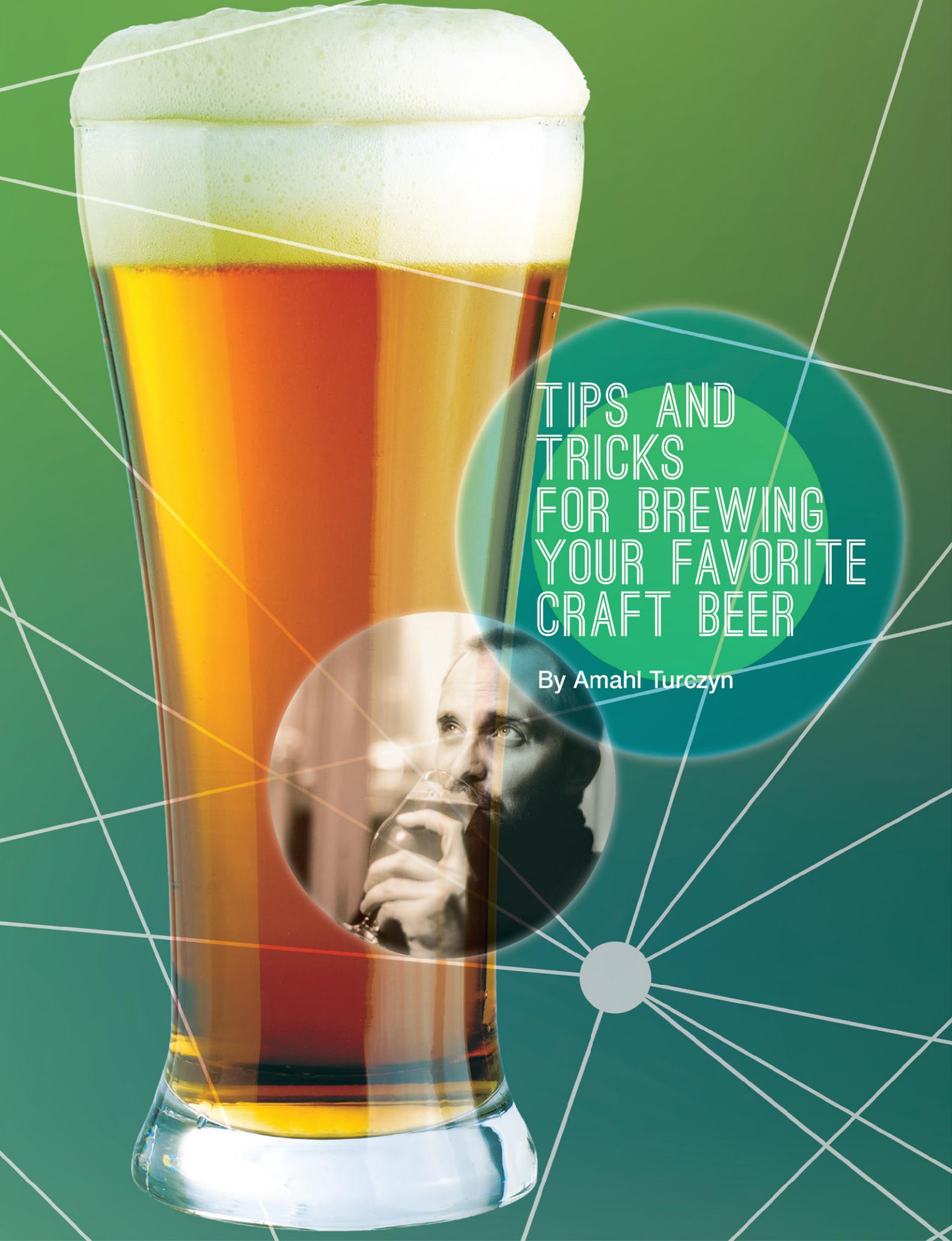
Better Control makes Better Beer!

- ✓ +/- 0.5° F control
- ✓ Prevent off flavors
- ✓ Fits carboys & buckets
- ✓ Easy to use and store



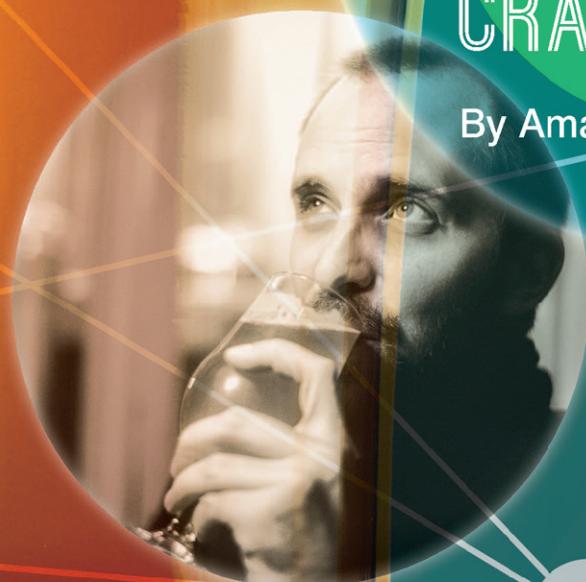


THE PATH TO **CLONING**



TIPS AND TRICKS FOR BREWING YOUR FAVORITE CRAFT BEER

By Amahl Turczyn



"Here's my basic recipe for Westcoastmalle. As you might guess, it's my homage (I don't use the word clone) to Westmalle Tripel."

—Denny Conn, *Experimental Homebrewing* (with co-author Drew Beechum)



with Denny on this one, so let me begin by clarifying that the term "clone" is somewhat of a misnomer. It suggests a perfect replica, indistinguishable from its intended target. The idea that we can crank out exact copies of the craft beers we most admire sounds great on paper—homebrewers are, after

all, becoming increasingly skilled in their chosen hobby. But given the challenges faced by the would-be cloner, perfect replicas take quite a bit of work.

For one thing, it takes a healthy investment for amateur brewers to have access to the kind of equipment the pros use. Very successful craft brewers have not

only invested in higher brewing education, but also in equipment to maintain purity and consistency of product. Dedicated yeast labs, state-of-the-art bottling lines, quality control, and quality assurance contribute directly to a professional brewer's vital reputation for product quality and consistency. I personally find the clean-in-place (CIP) cleaning and sanitizing equipment in a professional brewery setting both easier to use and more effective than trying to remove every last mote of soil from the inside of a glass carboy with a wire brush.

Then again, equipment isn't everything. When I suggested to Jamil Zainasheff—author, Brewing Network show host, and now professional brewer at Heretic Brewing Co. in Fairfield, Calif.—that professional equipment made a significant difference, he replied, "I totally disagree." In his experience on both sides of the brewing world, homebrewers can make beer every bit as good as what the pros produce. "I think the most common challenge for homebrewers is that they often don't accurately control fermentation temperature," Zainasheff said. "[But] that is about the only thing that separates them equipment-wise from making just as good a beer as the best breweries in the world."

Photos © iStock/JRD



Recognizing Ingredients

Brewers are faced with an increasingly diverse palette of raw ingredients to choose from in this modern, craft-centric renaissance. At one time, it was relatively easy to drink a '90s craft beer and say with confidence, "That's domestic two-row, some light crystal malt, and Cascade hops." Now, with dozens of countries wanting to show off their newest flavor hop varieties, the would-be cloner has a dizzying array of hops to become familiar enough with to actually identify in a beer. While malts aren't nearly as diverse, that's beginning to change. Can you tell Cara-Foam from Cara-Pils? Flaked wheat from torrified? CaraMunich from 60L? Chocolate malt from black malt? British ale yeast from English?

This is where sensory evaluation and experience come into play. As homebrewers, you're obviously already ahead of the game. Going down to your local homebrew shop and tasting various malts straight from the bin (though you should probably make sure it's OK with the shop keeper) can go a long way in helping you make these distinctions. Not every flavor you pick up from the raw ingredient is going to stay consistent through the brewing process, fermentation, and on to the final packaged, carbonated beer. But many will, and it's a great way to start training your palate.

Actually brewing with those ingredients, keeping recipes minimal, and learning how various specialty malts, yeasts, and hops work together is more advanced training, but it too is essential. Single malt and single hop (SMAsh) beers are great ways to train your palate and distinguish ingredient characteristics (see "Brewing on the Ones" in the November/December 2012 Zymurgy), as is brewing one large batch of wort, dividing it into small batches, and pitching several varieties of yeast. The more you brew with different ingredients, the easier it is to recognize their character in finished beer. Many ingredients are instantly recognizable: 80L crystal malt, for example, has a unique flavor, smell, heft, and color. Hefeweizen yeast is hard to miss, though telling one from another can be tricky, and fermentation temperature can cause a fairly wide variation in the resulting phenol/ester balance and pH. Even Pilsner malt has a unique

Sensory evaluation, as it is with judging, is the first step to the cloning process, but it's more than that.

aroma and flavor that, whether it's in the bag or the mash tun, you can learn to distinguish from pale two-row malt every time.

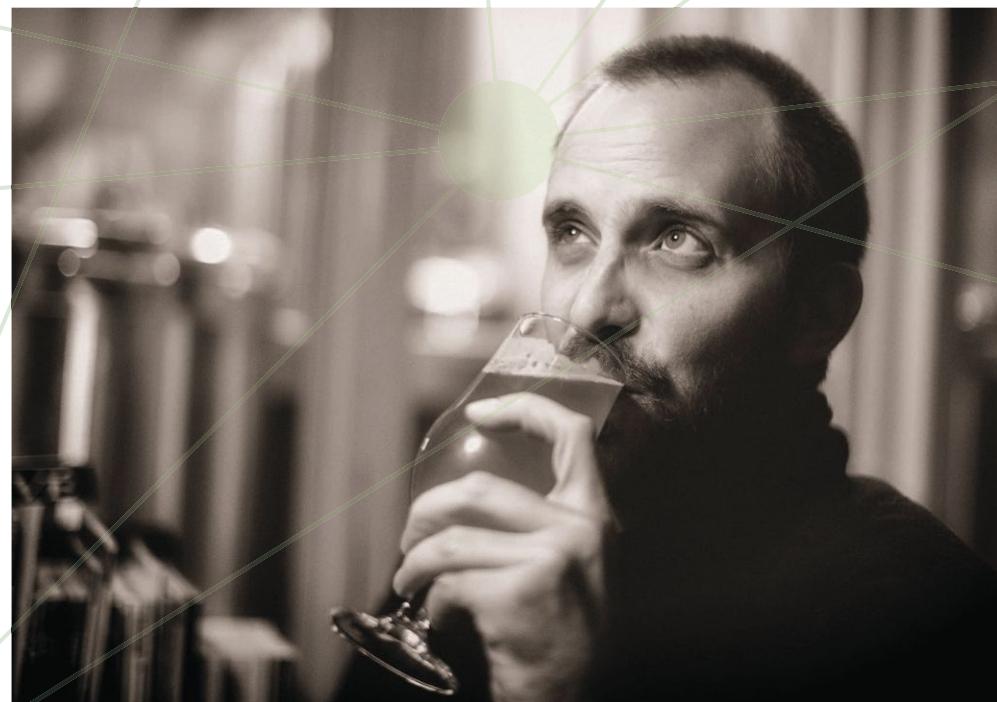
Beyond the interplay of raw ingredients, and the way they change through fermentation and aging, is process. Is the sweet finish and increased heft in your Munich helles the product of dextrin malt, or a high mash temperature? Are the dried fruit and tobacco nuances in that Baltic porter from an addition of Special B malt, or is it slightly past its prime and beginning to show signs of oxidation? Is that barely-perceptible vanilla note in your imperial stout from actual vanilla, or medium-char oak aging? Is the slight tartness in that cherry wheat from a lactic fermentation, an addition of straight lactic acid, acid malt in the mash, or is it simply tart cherries?

Thinking Like a Beer Judge

Not every beer is brewed to a designated set of style guidelines, but familiarity with classic and even obscure beer styles can provide a roadmap. Recognized styles often

become established because the original brewers were working under the constraints of available water and other ingredients, climate, and even imposed brewing laws like Reinheitsgebot. But recognized styles survived because brewers were able to successfully navigate those constraints to produce a beer with mass appeal. So before you make an attempt at brewing your favorite craft beer recipe, you need to use all your brewing experience, familiarity with ingredients, and knowledge of style to critically evaluate a beer and begin to break it down into its component parts.

Sensory evaluation, as it is with judging, is the first step to the cloning process, but it's more than that. When a beer judge sits down to evaluate an entry to a competition, she usually isn't thinking in terms of brewing the beer herself. But when you want to come up with your own version of a beer, you need to address each sensory component—visuals, aromatics, flavor, mouthfeel, and finish—in terms of replication in your own brewhouse.



8 Second Kölsch

Elevation Beer Co., Poncha Springs, Colo.

Elevation really hits the mark on this difficult style. They use floral, spicy Tettnang hops, Pilsner malt, and a bit of white wheat in this 4.2 percent ABV hybrid ale. Everything about 8 Second is delicate, elegant, and traditional. The color is pale straw, only slightly hazy; aromatics are clean Pilsner malt with a faint perfume of noble hops; carbonation is moderate; palate is light and refreshing, with a mere 12 IBUs of hop dryness; and the beer finishes with a lingering Pilsner malt flavor and a hint of tartness.

SENSORY EVALUATION NOTES

Appearance

Color: Very pale; <3 SRM

- malts used: Pilsner malt?
- gravity and boil time: little in the way of Maillard reactions

Foam structure: dense, long-lasting: wheat malt?

Clarity: slightly hazy: unfiltered? lagered? Does wheat contribute to haziness? Malted or unmalted wheat?

Carbonation: medium, ~2.4 vol. CO₂, fine bubbles

Aromatics

Malt: Pilsner malt: Continental or domestic?

Wheat graininess?

Hops: Late, whirlpool or dry hop additions?

Recognizable variety?

Yeast

- Esters, phenols, any yeast signature (lager-like cleanliness)?
- White wine? (yeast-derived or Sauvignon Blanc hops?) If yeast-derived, may indicate authentic Kölsch/Dusseldorf alt yeast strain.

Sensory Evaluation

Ideally, this should take place in a bright, naturally lit room free of distractions and other sensory input, particularly strong aromas (cooking food, cigarette smoke, etc.) that could taint your perception of the beer. Use a clean, suitable glass: my favorite is a stemmed globe that concentrates aromatics. Then take notes on each sensory aspect of the beer.

As you run through the list below, consider each component. Don't limit yourself to the first sense that hits you and move on. Beer is complex, with layers of perception. This is true for both positives and negatives: rare is the beer that has only one strength, or, conversely, only one flaw.

- **Appearance:** This includes not only how the beer looks in the glass, but

Flavor

- Malt sweetness (palate)
- Pilsner malt flavor (olfactory)
- Hop flavor (olfactory): Tettnanger? Willamette? Floral, mildly fruity hop complexity, noble quality, low intensity
- Overall harmony of flavors

Palate and Finish

- How does sweet/bitter palate balance transition to aftertaste?
- Palate weight/dryness: low dextrin/residual sweetness means a high degree of attenuation (low mash temps, no crystal or dextrin malt) and low finishing gravity
- Lingering hop dryness/bitterness? How does low kettle hop IBU contribution still allow for balance?
- Carbonation: carbonic acid contribution?
- Alcohol presence? Any sugar or grain adjunct used?
- Water: Any savory or salty quality? Accentuated hop crispness from calcium sulfate or malt roundness from calcium chloride?

color, clarity, foam density, volume, and structure. Is there sediment in the bottom of the bottle as you pour it? That can sometimes give you a clue as to the type of conditioning method. Does the foam linger or fade?

- **Aroma:** This is a purely olfactory sense. Use common and uncommon descriptors. If floral, what kind of flower? If fruity, what kind of fruit? Does it smell like wet forest? Burnt rubber? Linoleum? Keep in mind that as the beer warms, aromatics most likely will change. If it's a smoked beer, what kind of smoke? Is it a harsher peated malt aroma, or a more subtle oak or beechwood smoked malt? Does it completely overtake the beer, or integrate subtly? What percentage of the total grain bill of smoked malt do you think was used?

- **Flavor:** Flavor is somewhat misleading, as part of it is made up of what the tongue tastes—salty, sour, sweet, bitter, savory (or umami)—and part of it is olfactory, and thus closely linked with aroma. Many late-hopped beers will have a huge rush of hop aroma up front, ramping up your expectations for a following wave of hop flavor that never materializes. This is also true with tartness in a saison or wild ale: something about the aroma suggests lemons or tart cherries, but the following flavor (and then tartness on the palate) is something totally different. Again, ask yourself why—is it a yeast-derived ester complexity, an actual fruit addition, or something else? Note that as an olfactory sense, flavor can change with temperature. The beer will tend to “open” as it warms, and

Best-Guess Recipe for 8 Second Kölsch

INGREDIENTS

for 5.5 gallons (20.82 L)

7.5 lb	(3.4 kg) Pilsner malt (2.0 SRM) 90.9%
12.0 oz	(340 g) white wheat malt (2.4 SRM) 11.4%
4.0 oz	(113 g) acid malt (3.0 SRM) 3.0%
1.0 oz	(28 g) Tettnang, 4.5% a.a., boil 60 min, 16.0 IBUs
1.0 oz	(28 g) Tettnang, 4.5% a.a., boil 15 min, 7.9 IBUs
1.0 oz	(28 g) Tettnang, 4.5%, steep/whirlpool 5 min, 1.6 IBUs
	German Ale/Kölsch yeast (White Labs WLP029) 1 L starter

Original Gravity: 1.044

Final Gravity: 1.009

ABV: 4.2%

Bitterness: 25.5 IBUs

Color: 2.9 SRM

Mash: Double infusion, light body

Sparge Temperature: 168° F (76° C)

Water: Reverse osmosis treated
with 1g/gallon calcium
chloride: 72.0 ppm
Ca+2,127.4 ppm Cl-

Boil Time: 90 min

Efficiency: 77%

Mash pH: 5.20

Step 1: 148° F (64° C), 30 min

Step 2: 158° F (70° C), 30 min

Sparge: Fly sparge with 7.24 gal
water at 168° F (76° C)

Ferment at 65° F (18° C) for 7 days

Condition at 41° F (5° C) for 30 days

EXTRACT VERSION: Omit acid
malt. Substitute 6 lb (2.72 kg) Pilsner
malt extract syrup for the Pilsner malt
and 12 oz (340 g) wheat malt extract
syrup for the wheat malt.

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Newtonian Extra Special Bitter

Gravity Brewing, Louisville, Colo.

At 5.7% ABV, this is a strong beer even by ESB standards, but it's one of the lightest offerings on the brewery's menu... they aren't called Gravity for nothing. Not an overly hoppy beer, but the malt is just beautiful. Nuts, biscuit malt, toast, and graham crackers complete the classic British malt complexity, all from imported Maris Otter malt. Gravity also uses Cara-red, light crystal malt, and just a touch of black malt for dryness and a deep red color. Brewer Julius Hummer admits it's an expensive beer to brew, but it's definitely one of the brewery's best.

SENSORY EVALUATION NOTES

Appearance

Color: Deep red, ~18 SRM; pale, finely-beaded foam

- base malt: 3L Maris Otter, probably >80% of grain bill
- malts used: 60L crystal? ~10% of grain bill?
- 20L Cara-red ~7%
- 500L black patent, 2-3%

Foam structure: dense, long-lasting, probably from caramel malts

Clarity: bright; filtered? fined? lagered?

Carbonation: medium to low, per style; fine bubbles

Aromatics

Malt: Medium caramel is foremost; deeper malt complexities follow.

Hops: Restrained floral and orange peel hops just behind malt aromas; late boil addition, but not too late; no whirlpool or dry hops?

Yeast: Fruity but subtle ale aromatics; pear, apple esters, possibly stone fruit.

Note how aromatics change and open as the beer warms.

See clone recipe on page 40

more details will emerge; others, particularly volatile flavors and aromatics, may disappear.

- Palate (mouthfeel):** In addition to salty, sour, sweet, bitter, and savory, I would also add temperature and the prickly sensation of carbonic acid caused by CO₂ dissolved in the beer. The latter is crucial to styles like hefeweizen, as they contribute to overall balance. Conversely, the lack of carbonation on a nitro stout profoundly affects mouthfeel, adding a certain creamy sweetness and roundness not found in CO₂-charged beers. The palate is where you pick up the actual IBUs of

The actual brewer is the most reliable source of information on the beer you're trying to brew, and the good news is that a lot of craft brewers are on your side.

hop bitterness as well as astringency; tartness from sour beers; tannic pucker from wood-aged beers; and subtler but no less important details, like degree of attenuation. Was too low a mash temperature used, rendering the beer too thin and causing the hop bitterness to be excessively harsh and brittle? Or is the mouthfeel velvety and rich but not

sweet? That may be oatmeal or flaked barley. How many IBUs would you guess there are? High alcohol content can add dryness to a beer that in turn accentuates perceived bitterness.

- Finish/Aftertaste:** This is an extension of palate, more than anything, though there can be olfactory com-

ponents as well. What are you left with once that mouthful of beer is in your gullet? Balance is one aspect—not every beer is meant to end with a perfect balance, but the effect of the finish should be pleasing in some way. Alcohol presence can be detectable during any sensory stage, from fumes in the aroma to a burn on the palate, but in the aftertaste, it can manifest as a sort of glow in the throat and belly. Is there a lingering flavor as well as a sensation? Some flavors tend to stick with you long after the beer is finished, like the almond bitterness of some stone fruits (apricot) or the perfume-like taste of raspberries. Others are elusive, like peaches or blackberries. You will need to weigh amounts in the finish, relative to the rest of the beer, and start thinking about how you would duplicate what the brewer did if you like the result.

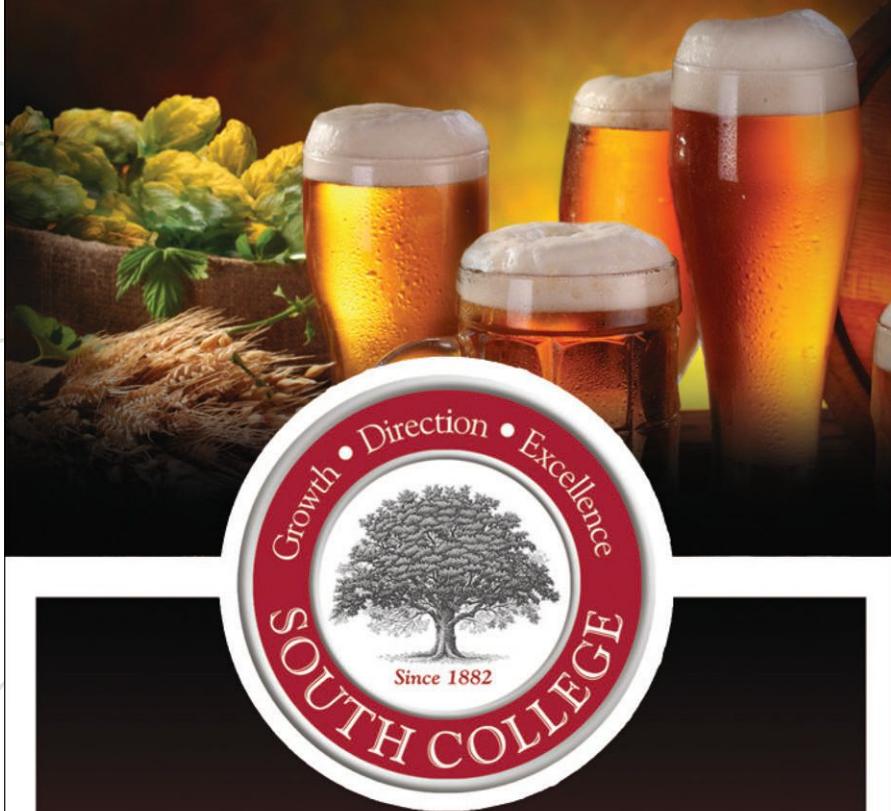
- *Overall Impression:* While many judges assign points for overall impression, it may not be completely necessary when analyzing a beer for replication. However, it's a good way to bring all your sensory data together. Ask yourself if you enjoyed the experience, what impressed you, and what you might change if brewing the beer yourself.

Research Sources

The more information you gather about a beer before you try to brew it yourself, the closer, at least theoretically, your attempt at duplicating it will come. Sensory evaluation is part of the research process, but there are many more sources of information available to tap into.

- *Brewers:* The actual brewer is the most reliable source of information on the beer you're trying to brew, and the good news is that a lot of craft brewers are on your side. They want you to try and brew their beer. Why? Well, often because they started out as homebrewers themselves. Many will go so far as to tell you their recipe, or something close to it, because they were in your shoes not so long ago. Also, they know beer enthusiasts and homebrewers are

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one of the main reasons their business exists; who better appreciates a well-brewed craft beer? If craft brewers are wily enough to see the big picture, and most simply have to be these days, they'll recognize that homebrewers can significantly contribute to their longevity and growth in the future. Pay proper respect to them for their hard work, show some humility, and frequent (and tip well at) their establishment: you might be surprised what they are willing to share.

- Brewery websites:** Of course, not all craft brewers like direct interface with the public. It may be difficult to chat with them directly, but many will make an email address available, and most are pretty good about answering curious fans. Almost all craft breweries have websites that offer information on available beers. Some just have the basics, but others provide %ABV, IBUs, OG and FG, color ratings, malt and hop varieties used, yeast type... nearly everything you need to brew your own clone of the beer except perhaps actual amounts. (A few brewery websites even offer clone recipes; see HomebrewersAssociation.org/how-to-brew/craft-breweries-share-homebrew-clone-recipes.)
- Podcasts and Books:** Several well-known brewers have gone to great lengths to assist would-be cloners. One of the best known is Zainasheff, whose podcasts on The Brewing Network represent a wealth of information on how to brew the world's best commercial beers. They are particularly useful because he often invited the actual brewers onto the show and asked them pointed questions on ingredients and techniques. Books can also provide guidelines for brewing clone beers, and there are several to choose from.
- Brewing Forums:** Rabid clone beer enthusiasts can put hours into honing a recipe. The more times they brew it, the closer they often get. At the very least, they learn what doesn't work, or what brings them further from the recipe, and in that case, communica-

Newtonian ESB (Courtesy of Gravity Brewing)

(My recipe guess called for 4 oz black patent, no whirlpool addition of Goldings, and London III ale yeast. Wrong!)

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

9.0 lb	(4.08 kg) Maris Otter pale malt (3 SRM) 81.1%
1.0 lb	(0.45 kg) caramel/crystal malt (77 SRM) 9.0%
1.0 lb	(0.45 kg) Weyermann® Cara-Red malt (20 SRM) 9.0%
1.5 oz	(42 g) black patent malt (500 SRM) 0.8%
0.5 oz	(14 g) Zythos, 14% a.a., boil 60 min, 21 IBUs
1.0 oz	(28 g) East Kent Goldings, 5% a.a., boil 20 min, 9.1 IBUs
1.0 oz	(28 g) East Kent Goldings, 5% a.a., boil 5 min, 3.0 IBUs
1.0 oz	(28 g) East Kent Goldings, 5% a.a., steep/whirlpool 5 min, 1.5 IBUs
London ESB ale yeast (Wyeast Labs 1968) 1 L starter	

Original Gravity: 1.058

Final Gravity: 1.014

ABV: 5.7%

Bitterness: 35 IBUs

Color: 13.4 SRM

Mash: Single infusion, light body, no mash out

Sparge Temperature: 168° F (76° C)

Water: North Denver tap water

Batch Size: 5.50 gal

Boil Time: 90 min

Efficiency: 77%

Mash pH: 5.20

Step 1: 154° F (68° C), 75 min

Sparge: Fly sparge with 7.24 gal water at 168° F (76° C)

Ferment at 68° F (20° C) for 4-7 days
Diacetyl rest at 70° F (21° C)
for 2 days

Condition at 35° F (2° C) for 14 days

PARTIAL EXTRACT VERSION:

Substitute 7 lb, 6 oz (3.35 kg) Maris Otter malt extract syrup for the pale malt. Steep crystal, black, and cara malts in 158° F (70° C) water for 30 minutes. Drain, rinse grains, and dissolve extract completely.

"When you're trying to figure out the amounts a brewer uses of specialty malts, one of the best guidelines is the 'by the sack' rule."

—Jamil Zainasheff, author, Brewing Network show host,
brewer at Heretic Brewing Co. in Fairfield, Calif.

tion with other amateur brewers with a similar goal can be a virtual godsend. It's worth doing a search online for your favorite clone beer target. You may have to weed through a lot of misinformation, but very often you'll find other homebrewers with recipe attempts and side-by-side comparisons.

Brewing Software: Brewing software just keeps getting better, but its sophistication and complexity can be daunting enough to eclipse user-friendliness in some areas. It also has limitations when it comes to helping a would-be clone brewer. For example, if you have a list of ingredients for

Pivo Hoppy Pils

Firestone Walker Brewing Co., Paso Robles, Calif.

Brewer Matt Brynildson loves hops, and uses them with surgical precision. This Pilsner is absolutely infused with the relatively new German noble variety Saphir. Oils from the hop are added just after the boil, even as the beer cools, allowing for clean, forceful aromatics without grassy or vegetal notes. Some bitterness is also extracted, but this pale Pils is hoppiest in the nose, with considerable palate presence, and a firm but not sharp bitterness in the finish.

SENSORY EVALUATION NOTES

Appearance

Color: very pale gold (3.5 SRM)

- White, finely-beaded foam; rich lace; adjunct doubtful?
- Malt: Pilsner (2 SRM), 100% of grain bill?

Clarity: bright; filtered? fined? lagered?

Carbonation: medium to medium-high, (2.5 vol?); fine bubbles

Aromatics

Malt: Pilsner malt: Continental or domestic? Probably German, high-quality, very pale and very clean.

Hops: Early boil, late boil, whirlpool or dry hop additions? Yes to all four.

Recognizable variety? Some herbal Spalter Select, but mainly Saphir; lemon blossom, mint and hay. Saphir hops dominate aromatics, with a greater intensity than is common for the style.

Dry hop? No vegetal or grassy off-aromas; if dry-hopped, how long and at what temperature?

Yeast: Any yeast signature (lager-like cleanliness)?

Flavor

- Malt sweetness (palate): very abrupt introduction, then

immediately dries to hop flavor and bitterness. Bitterness is not the focus here, however; emphasis on late hops.

- Pilsner malt flavor (olfactory): again, background but important role in support of hops. Very full, rounded. Calcium chloride?
- Hop flavor (olfactory): Spalter Select. Cross between Spalter and Hallertau Mittelfruh. Floral, delicately spicy (though not as spicy as Tettanger); floral hop complexity, noble quality, low intensity.
- Flavor and aromatic hop intensity is unorthodox, but showcases hop varieties. Hop intensity rivals Victory's Prima Pils.

Palate and Finish

- Palate weight/dryness: Very light palate weight: no dextrin or crystal malts, low mash temps, high attenuation. Dry finish accentuates kettle hops. Finishes with lingering hop oils, but no rasping or piercing bitterness.
- Carbonation: medium carbonic acid contribution; crisp.
- Alcohol: No heat or volatility apparent.
- Water: very soft, most likely reverse-osmosis water. Treatment with calcium chloride is probably desirable to bring base malt forward and smooth any sharp or brittle hop edges.

Best Guess Recipe for Pivo Pils

INGREDIENTS

for 5.5 U.S. gallons (20.82 L)

10.5 lb	(4.76 kg) Weyermann® Pilsner malt (2.0 SRM) 98.2%
3.0 oz	(85 g) acid malt (3.0 SRM) 1.8%
0.5 oz	(14 g) Magnum, 14.5% a.a., boil 90 min, 24.3 IBUs
2.0 oz	(57 g) Spalter Select, 4.75% a.a., boil 10 min, 10.8 IBUs
2.0 oz	(57 g) Spalter Select, 4.75% a.a., steep/whirlpool 10 min, 5.4 IBUs
2.0 oz	(57 g) Saphir, 3.5% a.a., dry hop 3 days at 55° F (13° C)
	German Lager yeast (White Labs WLP830) 2.5 L starter

Original Gravity: 1.054 SG

Final Gravity: 1.014 SG

ABV: 5.3%

Bitterness: 40 IBUs

Color: 3.5 SRM

Mash: Three stage step mash, light body, no mash out

Sparge Temperature: 168° F (76° C)

Water: Reverse Osmosis treated with 1g/gallon calcium chloride: 72.0 ppm Ca+2, 127.4 ppm Cl-

Boil Time: 90 min

Efficiency: 75%

Mash pH: 5.30

Step 1: 122° F (50° C), 20 min

Step 2: 145° F (63° C), 30 min

Step 3: 155° F (68° C), 30 min

Sparge: Fly sparge with 7.24 gal water at 168° F (76° C). Ferment at 48° F (9° C) for 14 days

Diacetyl rest at 55° F (13° C) for 3 days (dry hop)

Condition at 35° F (2° C) for 30 days

EXTRACT VERSION: Omit acid malt. Substitute 8.25 lb Pilsner malt extract syrup for Pilsner malt. Extract version may be slightly darker than all-grain version (4.3 SRM).

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the grain bill and a target color rating in SRM, you can cobble together a recipe to hit that target, but you still won't know exactly which dark malts, and in what proportion, were used to achieve the color.

Zainasheff offers a valuable tip for malt bill proportions. "When you're trying to figure out the amounts a brewer uses of specialty malts, one of the best guidelines is the 'by the sack' rule," he said. "Brewers don't like having lots of open sacks lying around the brewery and don't like having to weigh out odd amounts. So they tend to round up or down to the nearest sack. So, round off to either 55 or 50 pound sacks, depending on the maltster. The same can go for other odd ingredients. If it is close to a box, bag, or can, then that is the amount the brewer uses. The only exception to this rule might be highly kilned or highly flavored ingredients that make a large change in a small amount."

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The author (far right) with his pro brewers panel at the Big Beers festival in Vail, Colo.

Hop bills can be a little harder to figure out: a total IBU number is great, but is that mainly from an early addition, or was the lion's share added 15 minutes from the end of the boil? If you are lucky enough to find a recipe written out in percentages, and that's a fairly common method among craft brewers working on a variety of brew system sizes, then brewing software can be a wonderful resource—you can tailor your batch size exactly, and rest assured your proportions are where they should be. With the number of brewing variables, that still doesn't mean your clone will come out just like your target, but it's a big step in the right direction.

- **Beer Review Websites:** Though extremely subjective, posts on beer review websites may include a descriptor that you missed in your own analysis, or were unable to put into words. For example, one review described a German ale as having a hop profile with "minty" character. Perle and Northern Brewer have been described to possess this character, and more recently Polaris. So using not just your sensory analysis but that of other tasters can reveal clues to how a particular beer was crafted.

Breaking it Down

I was honored to give a talk on cloning technique at the Big Beers, Belgians and Barleywines festival in Vail, Colo. in January, joined by three incredibly talented professional craft brewers: Christian Koch of Elevation Brewing Co. in Poncha Springs, Colo., John Frazee of Gravity Brewing Co. in Louisville, Colo., and Matt Brynildson of Firestone Walker Brewing Co. in Paso Robles, Calif. Koch brews a Kolsch named 8 Second that is one of the finest examples of the style anywhere; Frazee and his partner Julius Hummer brew Newtonian ESB, a world-class English style bitter; and Brynildson brews Pivo Hoppy Pils, a famously intense hop-forward Pilsner. Included with my "homage" recipes are my initial reviews of the beers and notes taken during my sensory analysis.

Cloning is a difficult task, but a very rewarding one once you start getting close. And even if you don't perfectly nail it, you may come up with a version of a target beer that you like even better than the original.

Amahl Turczyn is associate editor of Zymurgy and a former professional brewer.

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AFTER ABOUT A YEAR-AND-A-HALF OF PLANNING, I'M JOINING THE RANKS OF THE BREWERIES SLATED TO OPEN IN 2015. I FLIPPED THROUGH MY NOTEBOOKS TO SHARE WHAT I DISCOVERED ON THE WAY TO STARTING MY BREWPUB, PARTICULARLY IN THE AREAS OF PLANNING AND FUNDING.



GOING PRO: PLANNING AND FUNDING YOUR BREWERY

BY STEVE STOWELL



The author takes a moment to relax during the early planning stages of his brewery.

BY ATTENDING MY LOCAL CHAMBER'S EVENTS, I GOT A FEEL FOR THE BUSINESS CLIMATE, TUNED INTO THE LOCAL ISSUES AND LAWS THAT WOULD AFFECT MY BUSINESS, AND MET LOCAL BUSINESS OWNERS AND VENDORS—SOME OF WHOM I WILL DO BUSINESS WITH.

GETTING STARTED

My business degree is 15 years old, so I needed a refresh before I dove into this market. The Small Business Administration has some great resources available nationwide. The first is SCORE, or the Senior Corps of Retired Executives (score.org). As the name implies, each SCORE chapter has a number of typically retired businesspersons who volunteer their time and experience to mentor those trying to start a small business. SCORE chapters in various cities offer a series of classes to help people who are either thinking about starting a business or have already. In their mentor program, you will be paired with someone with experience in your industry. For me that turned out to be manufacturing and restaurants.

The Small Business Development Center (SBDC), another branch of the SBA, also offers classes, mentors, and resources. The one near me offers classes on how to

use QuickBooks, how to build a website using Wordpress, and how to use social media for marketing. Many of the classes and networking events are free, or have minimal costs.

After refreshing my business knowledge, I started exploring what my community has to offer. Your local chamber of commerce is a great way to plug into the business community in which you'll be operating. By attending my local chamber's events, I got a feel for the business climate, tuned

into the local issues and laws that would affect my business, and met local business owners and vendors—some of whom I will do business with. As an added bonus, I got the word out through networking. Everybody loves to talk about beer!

Another great resource in my community was a local rising professionals group that I found on meetup.com. This one is connected with the local government, and has a networking/mentoring mission for young business professionals. (If you're starting a brewery because all you want to do is brew, you are missing a large piece of the puzzle. Read *The E-Myth Revisited* by Michael Gerber to find out why.) Through this organization I was connected with a local brewery owner and veteran to be my mentor through my startup process. I highly suggest finding a business mentor, even if they are not in the brewing business. Many principles are the same, from accounting to marketing to legal to sales, and it's great to have a local guide share his or her knowledge.

Many cities have entrepreneur organizations where you can find people in your same boat—trying to start a small business. National organizations include Startup Genome and New Tech, which have local chapters in big cities. Startup Genome has many great classes and seminars taught by successful entrepreneurs. Their biggest event is weekend startup contests, in which groups of entrepreneurs get together in cram sessions to begin planning their startup. Prominent people in various industries are often on hand to mentor the teams. The weekend culminates in a pitch to businesspeople and potential investors.

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New Tech's focus is more on getting groups of entrepreneurs together for networking. Their meetings revolve around five entrepreneurs getting five minutes to pitch their new business idea, followed by five minutes of questions from the audience. It's like a mini "Shark Tank," but a little less threatening. I pitched my business plan there and got great feedback that I incorporated into my plan.

Also look for a business incubator or accelerator in your area. These are typically private organizations that take in startup businesses and provide resources and mentoring. Often, once they get the startup to a certain level of competence, they introduce them to investors who might be interested. Typically these are for technology-based businesses, but many offer classes and are a potential source of investors.

WRITING A BUSINESS PLAN

Now that you're plugged into local business networking and support, you'll need to write a business plan and create financial statements. For me this was a bit of a litmus test. I had tested the waters by exploring the business climate, and a brewpub seemed feasible. Now I had to create the concept, and most importantly, determine if it would make money. I started with a handy financial spreadsheet from the Seattle branch of SCORE¹.

The purpose of the spreadsheet is to make a go/no-go decision on a potential business. It has up-to-date formulas for computing bank loans, equipment amortization, employee taxes, and federal taxes. By the time you get to the end of the tabs, you have a complete set of financial projections worthy of taking to a bank or investors. An analytical section points out potential flaws, and a section where you can input industry data compares that data to your financial ratios.

Once I determined it would be possible to make money with my idea (and how much it will cost), I had to put my plan on paper. All of the entrepreneurs I talked to highly recommended writing a business plan. All of them also informed me that almost no one will read it. Why write one then? Because the exercise of going through a full business plan and answering all the

questions is invaluable. It made me think through how I wanted to handle everything from start to finish: location, equipment, pricing, services, competition, hiring, marketing, growth, and even exit strategy.

I used the SCORE business template for a startup. It is a fairly comprehensive, pre-formatted document that explains the necessary content for each section. Unlike term papers from school, there is no official format for a business plan; you could do it on the back of a napkin. However, if you are pitching that plan to people for money, it does need to be professional and cover certain topics. This template covers the basics.

Another bonus is that you don't have to footnote everything in painful detail, as you would on a term paper. You do, however, need to be able to explain where you got your information. Bankers and investors will ask. You will have to make a lot of assumptions and "guesstimations," but industry data is very helpful. The two biggest organizations from which I retrieved data were the Restaurant Association and the Brewers Association. Others organizations that track beer industry statistics are Symphony IRI, GuestMetrics, Brewbound,

and Mintel. The global marketing research firm Nielsen provides some beer statistics and a lot of demographics. The latest statistics from these organizations can be found online.

Your local library may have some available resources. ReferenceUSA, a subscription database for businesses, is a great place to research your competition. Business & Decision and U.S. Consumers/Lifestyles are databases that focus on demographics through census and geographic information system (GIS) data. Standard & Poor's publishes surveys for the alcohol and restaurant industry.

The gold standard that most banks use, however, is the Risk Management Association's *Annual Statement Studies: Financial Ratio Benchmarks*. This can also be found in many libraries. As the name implies, it is a yearly compilation of financial statements from various industries. A credit analyst for a local bank told me that they compare your business ratios to the closest thing they can find in it. If your numbers are different, they start to dig in and ask why.

My business plan took a month of evenings to complete, and covered 45 pages.

Working with a city planner in Colorado Springs.





Planning for Triple S Brewing has taken about a year-and-a-half.

Again, while the main value comes from thinking through every aspect of the business in advance, it's important to focus on the executive summary and the financial statements. These are the things that most people will read. Make sure to continuously update your plan as well. In the beginning, your plan will be based on a lot of assumptions. As you learn more and do more research, you will begin to replace those assumptions with facts.

DOING THE PAPERWORK

Now that I had a focused idea of what I wanted my brewery to be, the next thing I did was to pick a name and secure the social media: the URL for the website, the Facebook page, the Twitter account, etc. It's no secret that trademark issues abound in the craft brewing industry, so it's important to do your homework before choosing a name. The U.S. Patent and Trademark Office (www.uspto.gov) is the official place to check trademarks. Consider immediately trademarking your name, although it is expensive and time consuming.

The next step is to pick a business form for your company, which is necessary to register your business. An LLC is a good idea if you are seeking investors—it allows multiple classes of stock and is easy to restructure, but it doesn't work as well for payroll taxes. An S-corp is better for payroll taxes and passing on initial losses; it's a little more complicated because it

requires more paperwork. A C-corp is the best tax-wise, if you are paying dividends². All three are considered standalone entities and can protect your private assets, as long as you follow basic rules like not mixing private and business funds, and establishing separate accounts. Check with your state government for the process.

After this, I filed with the IRS for an Employee Identification Number (EIN). This is like a social security number identifying your business as a taxpayer. Once you've filed for this, the IRS will be looking for your business to file a tax return, even if you aren't making money yet. An EIN can be obtained online. I had to pay a small fee and I got it within a day. In Colorado, I needed an EIN in order to apply for a business license from the state. Note than an EIN is separate from your TTB license. Most states require a license for any business, likely for tax purposes. My county and city also required filing for a tax ID number.

While I was filing the paperwork, I was also building my small business team. You are likely not an expert in everything and will need help in certain areas. Most small businesses will need the services of a lawyer, accountant, banker, and commercial real estate agent. A lawyer can help with initial setup documents and signing contracts. The accountant can help you set up your business entity and books. Choosing a good banker is important for your business needs such as accounts, credit card systems, and business credit. A commercial real estate

agent will search for locations for you. By the way, the agent's fee is typically paid for by the lessor/seller, and you pay nothing!

The next step is to file with the Alcohol and Tobacco Tax and Trade Bureau (ttb.gov) for a license to manufacture alcohol, whether a brewpub or production brewery. To do this, you must either own or lease the location and own or have purchased all the brewing equipment. Part of the application requires that you submit a map of exactly where all your equipment will be located. During an inspection, the equipment must be in the area indicated on the application, or the license can be denied or revoked. Many commercial real estate leases require a five-year lease. Be aware that the wait for a TTB license can be lengthy; in March the average wait time was 115 days. The current wait time can be checked on the TTB website³.

SECURING FINANCING

I researched many funding possibilities and settled on an SBA-backed loan through a local bank. In the end it was the cheapest and easiest money. Here's a summary of what I learned about the different types of funding:

ANGEL INVESTORS: These are accredited investors who let startup businesses use their money in return for something. The Securities Exchange Commission (SEC) defines an accredited investor as someone who has \$1 million net worth not including their primary residence, and has made more than \$200,000 a year for the past two years⁴. A majority of private equity investment is by angels, who typically invest in projects of \$2 million or less. Many times they will want ownership and/or participation in the business. They want to get paid before you do, and they typically want to see five to 10 times return on their investment in three to seven years⁵. It's highly unlikely that you will be able to provide this from your cash flow, so usually this kind of payoff involves growing the business big, and selling it.

VENTURE CAPITAL: These are companies that have or pool a lot of money, with the purpose of investing in startups. They typically invest in projects greater than \$2 million. Their modus operandi is to



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invest in a number of startups with the hope that one or two will hit it big. As such, they are looking for upwards of 10 times a return on investment in a short period, around five years. Like angels, they will want control of the company, many times much more control. They want to ensure the exponential growth of the business in which they are investing. Again, this involves growing the business very big, and selling it to a large corporation⁶. Less than 1 percent of startups are funded this way⁷.

PRIVATE EQUITY: This involves selling a portion of your company to private investors, typically accredited investors, but they can be non-accredited. You've likely heard of an initial public (stock) offering (IPO). In the case of private equity, you are making a private stock offering. I found the legal fees to draw up a private stock offering to be cost prohibitive, and I was restricted by SEC laws to only accredited investors. There are exemptions to the SEC laws; a great presentation about this was made at the 2014 Craft Brewers Conference and can be accessed online if you're a Brewers Association member.⁸ I consulted a lawyer and drew up paperwork to raise money under exemption 504. This allows any number of non-accredited investors, as long as you are raising less than \$1 million per year. This meant I could approach friends and family about investing.

It's important to note that the SEC doesn't allow "soliciting" or advertising for any kind of investor. You can't post on Facebook or put an ad in the paper that you are looking for private equity. It all has to be through word of mouth, although the SEC allows solicitation of accredited investors on websites like Bolstr and AngelList, or through angel investor groups. Either way, it requires finding someone and "pitching" them your plan and potential investment. You can find great examples of a pitch at pitchenvy.com. In the end I found this difficult and onerous. It was difficult to

find interested folks, and once I did, they typically required lots of teaching about the investment, for small rewards.

CROWDFUNDING: This is what I call the public radio drive of funding: encouraging people to give you money for something in return. It bypasses SEC rules on investing because participants are in effect buying something. EquityNet,

Crowdfunder, CraftFund, and Kickstarter are the most recognized websites that connect startup businesses with people. Most crowdfunding is rewards based—people give you money, you give them something (like swag) in return. Fulfillment of the swag items can get tricky if you have a significant number of participants (in December 2012, 41 percent of the 71 brewery campaigns reached their goal; the average number of donations was 231)⁹.

PUBLIC BANK LOANS: This can be a way to get money without selling equity. In

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the end, it is usually cheaper than seeking investors—they want a higher rate of return than a bank will. This involves going to your local commercial bank and applying for a loan. All commercial banks have federally mandated rules they have to comply with. If you are a startup with no history, many banks won't be interested due to risk. To a bank, a brewery is a restaurant, which has a stigma of large failure rates.

The bank will consider the loan if you have significant collateral, such as your house or brewing equipment. Generally a bank wants the full amount of the loan covered. In rare cases, a bank will take a personal guarantee of payment, instead of collateral. This means if you default they will file a judgment against you, which means they can garnish tax returns and other wages.

If you don't have enough collateral, consider a loan backed by the Small Business Administration. In this case, a bank lends the money, and some of the loan is backed by the SBA. With a 7a type loan (the most typical), federal tax dollars, through the SBA, will cover 75 to 85 percent of the bank's loss if you default. This can lower the amount of collateral required, and is the route I ended up taking. The terms are decent, typically seven to 10 years, and repayment is flexible. The 7a loan covers equipment and startup costs, and the 504 loan is for long term fixed assets, usually a building. Realize that banks will want to see you put something down for a 7a loan, and they require 10 to 15 percent down for a 504 loan. See SBA.gov for details.

PRIVATE LOANS: This is a potentially cheaper and easier way to have other people help fund your brewery. If you don't want to sell equity in your company, this can also be a good option. Interested parties basically loan you the money, per a contract that you both agree on. A unique twist on this is to have a party buy the equipment or portions of the equipment, and lease it back to you. In this case, they own something tangible, and can sell it if the business goes under. This requires a carefully written contract, however. Seek the advice of a lawyer.

There are also private loan companies. Private lenders are different from commercial banks in that the money comes

from private investors, and thus is not bound by federal rules. Because of this, they can lend to whomever they choose. They will want similar things as a bank, at a minimum your credit score, business plan, and financial projections. The rate and terms are completely up to them, and can be competitive with a bank. Lending Club (lendingclub.com) is a national example. Search for peer to peer or P2P lending online to find local ones in your area.

LEASING: A number of companies will provide financing and/or leasing of brewery-specific equipment. These include Brewery Finance, First Key Consulting, Boston Capital Leasing, and Balboa Capital. Typically this involves leasing the equipment from them, or getting a loan from them for startup capital. Like a bank, they will want collateral for the latter; be prepared to put up your house. Also realize that in a lease situation, in the end you will pay much more than the equipment is worth. If that's acceptable to you, this can be an option.

BOOTSTRAPPING: This involves starting small and scrounging up the money on your own. Many of the breweries in my area started this way, typically by keeping their day job and working the brewery at night. Another option is to get a second job and focus on banking enough money to pay cash for your brewery. With bootstrapping you will basically make up for shortfalls in money with your time and effort—sweat equity.

You don't have to have an MBA or millions of dollars to plan for and fund your brewery. Take advantage of the many resources available to help you get started on the right path.

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BEERPACKING

THE UPS AND DOWNS OF HIKING WITH BEER





BY DAVE CARPENTER

The Continental Divide National Scenic Trail (CDT) stretches for 3,100 miles along the spine of the North American continent, connecting Mexico with Canada. Hikers determined to walk the whole thing in one shot usually start at a completely out-of-the way obelisk in the high desert of New Mexico's boot heel and end up at a pair of slightly less out-of-the way obelisks in Waterton-Glacier International Peace Park four to six months later.

Along the way, CDT hikers pass through 25 national forests, 21 wilderness areas, three national parks, and one national monument. Most trail days include the traverse of a windswept alpine ridge, an amble through a wildflower-blanketed meadow, or a stroll through stands of spruce and pine, some of which haven't yet completely succumbed to the bark beetle epidemic ravaging western forests.

What you won't find on the CDT, or in most wild places, is beer. Trail towns usually offer oases of ale and lager, but you're on your own in the backcountry. Lakeside evenings by the fire do offer their own intrinsic rewards, of course, but I have yet to find a beer that does not pair well with wilderness sunsets. Even styles I don't normally drink at home are quite welcome

on the trail, kind of like the golden arches when you're traveling and hungry. And it never hurts to have something to look forward to on those relentless uphill sections.

Fortunately, backpackers who enjoy a good beer (a redundant phrase in my experience) have some excellent options these days. Increasing numbers of craft brewers are packaging in hiker-friendly cans. Homebrewers can bottle their own creations in lightweight plastic. And a mountain-grown company has even developed a system that lets you make your own backcountry beer: Just add water.

Load up your pack and lace up your boots, but don't forget the ultralight shaker pint. The wilderness just got a lot more civilized.

RAISE A GLASS

Some beer only comes in glass bottles, and there's nothing you can do about it. Carrying glass bottles into the wilderness isn't ideal, but it's doable for a night or two, especially if you're with a group. Have everyone carry in a bomber of something special, and divvy up group equipment like first aid kits, water filters, and stoves. The less camping gear on your back, the more room for a nice barley-wine. Just make sure your multi-tool has a bottle opener.

Something to keep in mind with glass is the potential for exploding bottles. If you bring in a homebrew that's carbonated near the bottle's pressure limit and then, say, cross a high mountain pass, you might end up with a bottle bomb in your pack. You've been warned.



PET PROJECTS

Polyethylene terephthalate (PET) bottles are my preferred vehicles for getting my own homemade beer into the backcountry. Amber PET bottles typically hold half a liter and are readily available from most homebrew retailers. On a per unit volume basis, a PET bottle of homebrew has about the same weight penalty as an aluminum can of commercial beer.



GLASS BOTTLES

PROS

- Homebrewers can enjoy their own creations by the campfire
- Many of the best commercial beers are only available in glass
- At press time, neither La Folie nor Pliny the Elder was yet available in cans (What's the holdup, folks?)

CONS

- Glass bottles are heavy, bulky, and fragile
- Glass bottles occupy the same volume, whether empty or full
- Major elevation changes could create beer grenades
- You have to haul in a lot of liquid

WEIGHT/VOLUME RATIO*

- 1.6 (12 oz standard longnecks and 22 oz bombers)
- 1.8 (750 ml coked, caged Belgian bottle)
- 1.9 (750 ml coked, caged Champagne bottle)



PET BOTTLES

PROS

- Lightweight
- Can be reused as water bottles once empty
- Moderately crushable, more so if gently heated next to a campfire

CONS

- Bulky and awkward to pack
- Sturdier than glass but by no means bulletproof (Don't drop your pack on a rock!)
- You still have to haul in a lot of liquid

WEIGHT/VOLUME RATIO*

- 1.06 (500 ml PET bottle with cap)

* The weight/volume ratio represents how much weight you have to schlep for a given volume of beer. The lower the number, the easier it is on your back for an equivalent number of servings. Attention science nerds: The ratios can be considered as dimensionless specific gravity figures or as absolute densities in grams per milliliter.

YES YOU CAN!

A few years ago, I joined six other volunteers for a 10-day trail improvement project deep within the Weminuche Wilderness, a 488,000-acre nature reserve in the San Juan Mountains of southwestern Colorado. Pack animals brought in work tools and bulky group gear, but each of us was responsible for carrying our own tent, sleeping bag, clothes, and other necessary personal items on the 10-mile hike to base camp.

My necessary personal items included a six-pack of Modus Hoperandi in cans. I didn't enjoy hauling five extra pounds over the 12,000-foot mountain pass, but those IPAs sure tasted great with the evening meals. And my pack got much lighter for the hike back to the car.

Aluminum remains the gold standard for transporting beer into the woods and beyond. The can's compact shape is easier to pack than a bottle, and it weighs next to nothing when empty.

BACKCOUNTRY BEER

And now for every beer-loving backpacker's dream. Well, almost. Pat's Backcountry Beverages is an innovative system that lets hikers reconstitute what amounts to "beer syrup" using fresh filtered water from the stream. The beer concentrate comes packaged in little pouches that resemble energy gels like Clif Shot (to avoid unforeseen surprises, backpackers who carry both are advised not to confuse the two).

The system includes a special carbonator that looks like a standard water bottle, except there's a contraption at the top into which you place a mix of potassium bicarbonate and citric acid. When



CANS

PROS

- Lightweight and sturdy
- Empties crush down to little metal hockey pucks
- Uniform shape is easier to pack than bottles

CONS

- Smaller selection than bottles, but improving all the time
- Empties, though small, still take up pack room and must be carried out
- You still have to haul in a lot of liquid

WEIGHT/VOLUME RATIO*

- 1.05 (12 oz aluminum can)



INSTANT BEER

PROS

- Lowest weight/volume ratio of any option by far
- Excellent choice for spending many nights on the trail
- Innovative carbonator doubles as a water bottle
- Carbonator can also make seltzer and soda

CONS

- Only two beer flavors are available at press time: Pale Rail pale ale and Black Hops black IPA.
- The flavor leaves much to the imagination, but after the first night out, you might not care.
- Works best with filtered cold water. Hikers who treat water with iodine or by boiling are out of luck.

WEIGHT/VOLUME RATIO*

- 0.69 (One 16 oz serving)
- 0.42 (Two 16 oz servings)
- 0.33 (Three 16 oz servings)
- The more you drink, the lower the number!



combined with water, these chemicals react and release carbon dioxide, which pressurizes the bottle. If you use cold water, a couple of minutes of vigorous shaking dissolves enough carbon dioxide into solution to deliver a reasonably carbonated beverage.

I won't lie and say that the resulting beer is outstanding, but when one is a few days' walk from civilization, one's standards for beer roughly parallel one's standards for personal hygiene. I used the system last summer on a three-day trip and found the insta-beer acceptable. I'd

probably stick with aluminum cans for a simple overnighter, but for two nights or more, it's not a bad option.

What really makes the system shine, though, is its flexibility, because you're not limited to beer. In addition to the two beer syrups (there's a pale ale and a black IPA), Pat's also offers a variety of soda syrups (SodaStream syrups work, too), or you can enjoy some seltzer water *au natural*. And the carbonator serves double duty as a water bottle during the day.

OTHER CONSIDERATIONS

I've found that even ambient temperature beer tastes just fine when I'm backpacking, but it's easy enough to have a cold one. Just bring along a small mesh stuff sack and a length of nylon rope to securely stash your sixer in the river while you set up camp. That Heady Topper (if you live in Vermont or have sold your soul in a trade) will be cool enough to enjoy alongside your dinner of rehydrated rice and beans.

Of course, I would be remiss to advocate enjoying beer in the backcountry without including my soapbox about doing so responsibly.

1. Please be careful with alcohol at high elevations. Acute mountain sickness

(AMS) and high altitude cerebral edema (HACE) are very real, and beer won't do you any favors. Don't let an evening of indulgence ruin your trip.

2. Please drink every last drop of any beer you open or prepare. Then thoroughly rinse the empties, whether cans or bottles, and disperse the rinse water over a wide area well away from camp. This is especially important in bear country, as some bears have come to associate metal cans of any kind with food. Follow normal bear safety precautions.
3. Please respect the experiences of other hikers. Nothing destroys a breathtaking sunset more than a cacophony of drunken echoes from the adjacent valley. This is more an issue at developed campgrounds than it is deep in the wilderness, but with increasing numbers of people enjoying the backcountry, it's worth keeping in mind.
4. Please, please, please, carry out everything you carry in. I was delighted to discover an abandoned, unopened can of Dale's Pale Ale on a recent trip (yes, I drank it), but it should never have been there in the first place.

Everything in life is about balance, and few understand this better than backpacking enthusiasts. Before every trip, you put all of your gear in a pile and consciously decide what goes on the trip and what stays home. Not hiking in mosquito season? Maybe you eschew the tent in favor of a ground cloth and tarp. Rain in the forecast? Better bring the good waterproofs. Choosing your backcountry libation is no different.

I haven't tackled the entire Continental Divide Trail (yet), but I hear it's not uncommon to drop 20 pounds of body weight on the walk from New Mexico to Montana. That just happens to be about the weight of a case of Modus Hoperandi cans.

Coincidence? I think not.

Dave Carpenter is a freelance writer, a regular contributor to Zymurgy, and an avid homebrewer. He enjoys hiking, travel, coffee roasting, and cooking. Dave lives in Fort Collins, Colo., with his wife and two cats.

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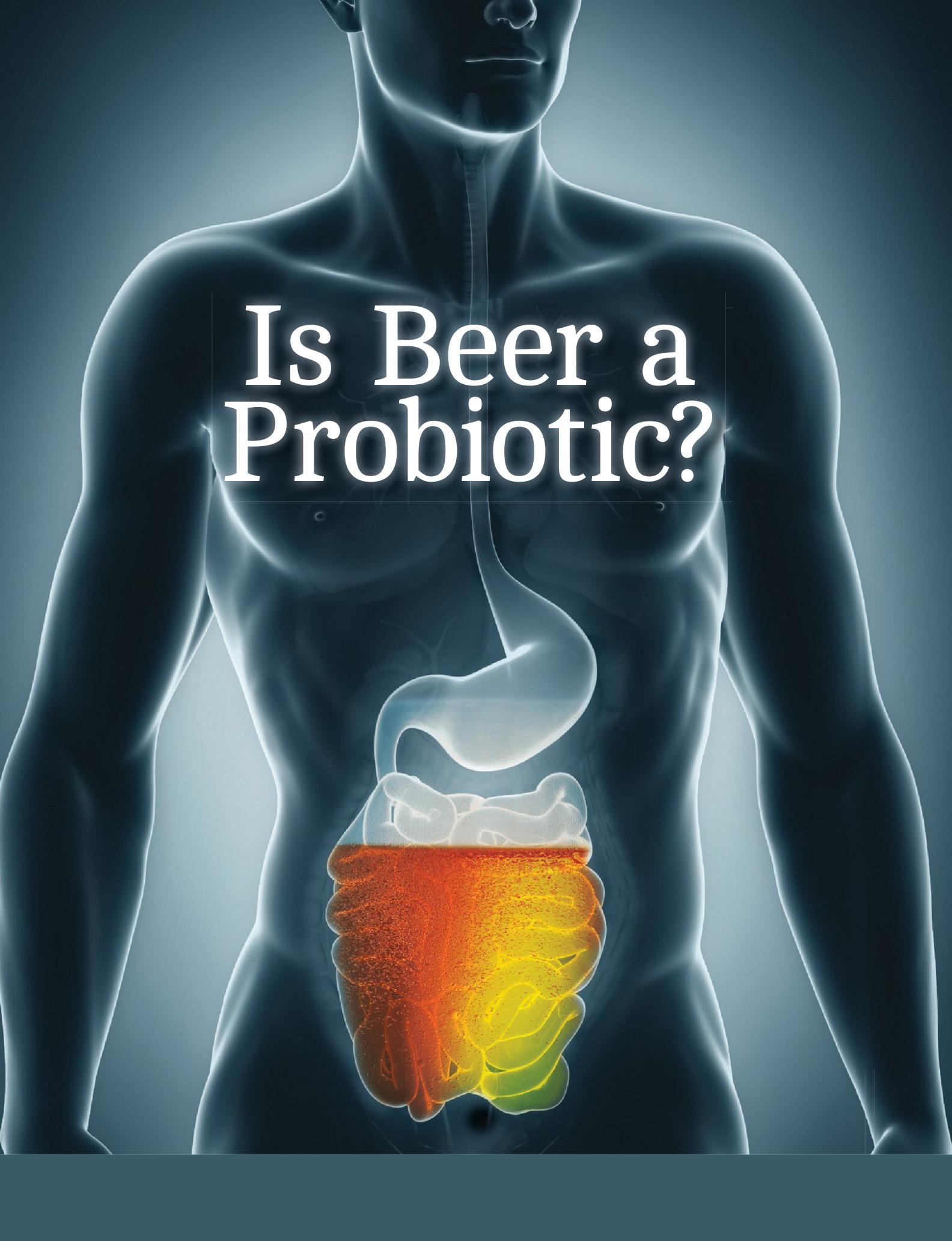
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Is Beer a Probiotic?

EDITOR'S NOTE: This is the sixth published experiment from the AHA's Research & Education Fund. For more on the REF and to see other completed projects, go to HomebrewersAssociation.org/community/research-and-education-fund. The data and observations presented in this report were derived from only one experiment from one person and therefore should not be considered conclusive.

The effects of live-culture beer on one man's microbiome

BY MATTHEW J. FARBER, PH.D. AND DEREK DELLINGER

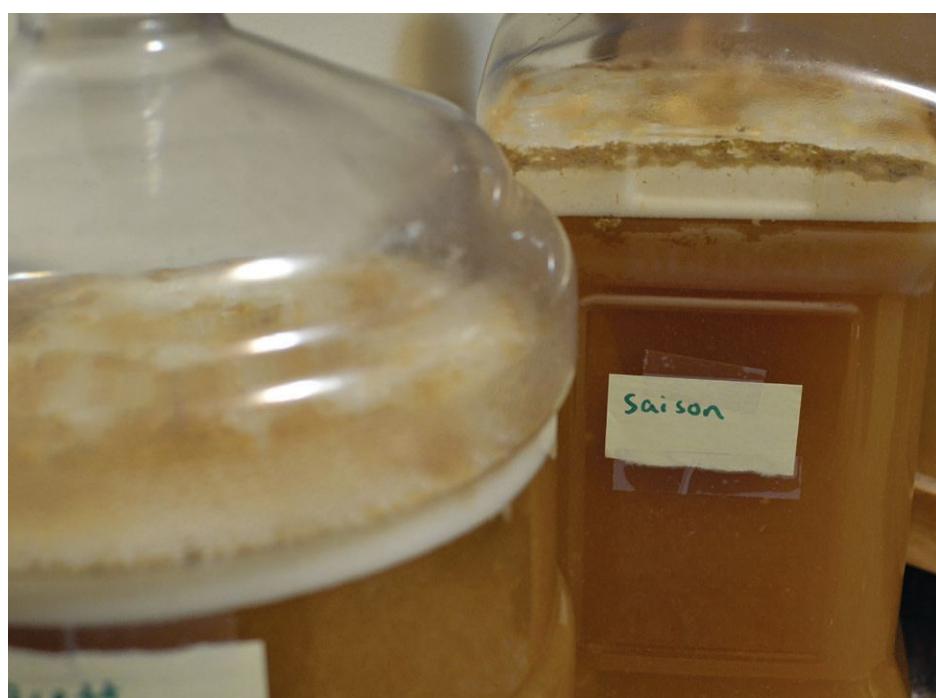
Because live-culture, sour homebrew contains a common probiotic genus, *Lactobacillus*, we were curious to see if moderate consumption of homebrew could influence a person's microbiome. We also wanted to start a discussion about whether live culture homebrew might be considered a probiotic beverage.

THE MICROBIOME

There are 10 times as many bacteria in the human body as there are human cells¹. Many are found in the colon; however the skin, mouth, nose, genitals, mammary glands, and even eyeballs contain a distinct population of bacteria termed the microbiome. The presence of beneficial microbes is thought to contribute to a healthy lifestyle by limiting growth of pathogens, producing antioxidants and beneficial neurotransmitters, reducing inflammation, and limiting nutrient malabsorption². With large scale, modern DNA sequencing, scientists can now investigate the influence of environmental or genetic differences on the microbiome, providing connections to various diseases.

In general, the adult gut microbiome is resistant to large changes in population dynamics; however recent studies have shown that dietary changes can induce temporary microbiome fluctuations in as little as 24 hours³. Thus diet is an important consideration in maintaining a healthy microbiome.

Probiotics are defined as live-culture products that confer benefits to the



consumer by positively influencing the intestinal microbiome. A common probiotic found in yogurt, sauerkraut, kefir, and sausage is bacteria of the genus *Lactobacillus*. Historically, lactic acid bacteria (LAB), generally *Lactobacillus* or *Pediococcus*, unknowingly contaminated most styles of aged beer, often in collaboration with “funkifying” wild yeasts like *Brettanomyces*. A mild case of souring was, at least in many instances, an anticipated stage in the lifespan of a beer. For many beers, the slow attrition of fermentable sugar into tart lactic acid would have been part of the expected flavor profile. The further increase in acidity created by lactic acid bacteria even further stabilized the beverage from harmful bacterial contamination, as most microbes cannot survive in a low pH environment. In historic saisons, the succulent qualities of the lactic sourness allowed a refreshing beer to better serve its intended function: a nutritious drink for farmhands. And in their beer, these thirsty farm workers consumed similar species of bacteria also found in their preserved, probiotic sauerkrauts and fermented milk products.

In the 19th century, fermentation was understood only in broad terms. Before Louis Pasteur and Emil Christian Hansen revolutionized sanitization and yeast culturing respectively, *Lactobacillus* bacteria were typically present throughout the brewhouse, settling into their niche in the microbial ecosystem alongside yeasts. Many modern brewers, however, draw their inspiration from the historic styles of Germany such as Berliner weisse. Sour mashing (and the related method of kettle souring) relies on elevated fermentation temperatures that favor *Lactobacillus* to induce a quick, frenzied souring of the wort. Such a procedure is typically performed prior to the boil, so that the microbes are killed and fermentation can continue as a “clean” fermentation, without risk of infecting equipment and subsequent batches. As one can imagine, any probiotic potential of this particular fermentation product is then lost.

Direct and intentional pitching of LAB during primary or secondary fermentation permits the microbes to thrive long after fermentation and bottling. But many brewers find such mixed-culture fermenta-

tions to be more difficult to manage, with different microbes favoring different wort conditions and temperature ranges. Brewers may feel there is a risk to their equipment and future batches by letting “infection” microbes remain alive in the beer. In addition, some (but not all) mixed-culture fermentations with living bacteria may require more time before packaging and distribution, thus adding budgetary drawbacks.

But with the rise of mixed-culture beers in modern craft brewing and homebrewing, the focus is predominantly on the flavor profiles and acid produced by the LAB, with little thought on additional benefits they may provide, such as the potential to act as a probiotic. With the rise in popularity of citizen science projects such as the American Gut Project and uBiome, an interesting opportunity arose to study the effects of live-culture homebrew on the microbial population of one man’s gut.

The idea for this experiment was borne out of a separate project undertaken by one of the authors. During the entirety of 2014, Derek’s diet consisted of 100-percent fermented food, as documented in his upcoming book, *The Fermented Man*. Both authors have long had a fascination with homebrewing, sour beers, and the microbes that produce them. While much attention is given to the probiotic benefits of microbes in many other fermented foods, little mention of their existence or possible effects is ascribed to sour beers, which often contain the very same genus of LAB as yogurt or sauerkraut.

TABLE 1:
An example of the fixed diet consumed during the course of the experiment

Breakfast	Lunch	Dinner	Other
Multivitamin	Turkey, cheese, spicy brown mustard on wheat	Two breaded chicken fillets	Banana
Wheat toast, peanut butter	Apple	BBQ sauce	Afternoon cup of coffee
Cup of OJ	Nature’s Bakery Fig Bar	1/2 cup frozen corn	
Large coffee	Handful of almonds	Mixed greens salad with onion	
		Oil and balsamic vinaigrette	
		Fruit popsicle	

MATERIALS AND METHODS

Matthew Farber was the experimental subject of this project.

The Diet

A balanced and fixed diet was consumed each week for three consecutive weeks of the experiment, Monday through Sunday. The meals varied each day, but a strict diet log was followed so that each week, the diet remained identical. Week 1 was no beer; week 2 included two saison beers a day; and week 3 included two lacto-saison beers a day. Food brands were kept consistent across the entirety of the experiment. Table 1 lists the Monday diet. Foods with probiotics were excluded. Filtered or bottled water was imbibed without controlling for daily volume. Beers were consumed with dinner. Consistent steps were taken to ensure transfer of yeast/LAB sediment from bottle to glass.

The Homebrew

Wort for the beer was prepared using a standard all-grain brewing procedure, utilizing a low mash temperature for a more attenuated beer and thus a final product with as little residual sugar as possible. No hops were added to the wort at any point prior to fermentation, as they can inhibit LAB growth. Once cooled to room temperature and transferred into a carboy, the unhopped wort was pitched with White Labs Saison II and Mangrove Jack’s Belgian Ale yeast, both *Saccharomyces* strains. At the same time, a mixture of four *Lactobacillus* strains from a variety of sources was



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pitched, as well as *Brettanomyces lambicus*, *Brettanomyces custersianus*, and the yeast strain marketed as *Brett Trois*. All pitched microbes were allowed to carry out fermentation simultaneously and at the same temperature. Fermentation was carried out at ambient room temperature, approximately 72 to 75° F (22 to 24° C). Visible primary conditioning was concluded within one week. The beer was given seven weeks to reach terminal gravity. The lacto-saison beer was then dry-hopped with four ounces of Citra leaf hops for one week before bottling and is referred to as Lacto-Saison in this report. In the Saison version, the four *Lactobacillus* strains were omitted.

Sample Collection and Analysis

Gut kits were ordered from uBiome (Figure 1). Stool samples were collected at the conclusion of each week on Monday morning, closely following the instructions included with the kits, and sent to uBiome where they were processed and sequenced. DNA sequences corresponding to specific microbial populations were analyzed by uBiome, the results of which were displayed via their Beta software. uBiome enables users to see the relative abundance of the bacterial phyla in the sample as it compares to the average for all samples received (Figure 2). The microbiome data can also be arranged as a tree, organized by scientific taxa. While some species level information can be obtained in the raw data, only genus level information was displayed on the tree. uBiome enables users to select a bacterial taxon and read about microbe descriptions, trends, and known population differences. Based on a short survey all users complete prior to sample collection, the user data can be compared to the average data assigned to groups such as Heavy Drinkers, Vegetarians, or Healthy Omnivores. Heavy drinkers were defined by uBiome as people who reported consumption of “five drinks in a single sitting multiple times a month.”

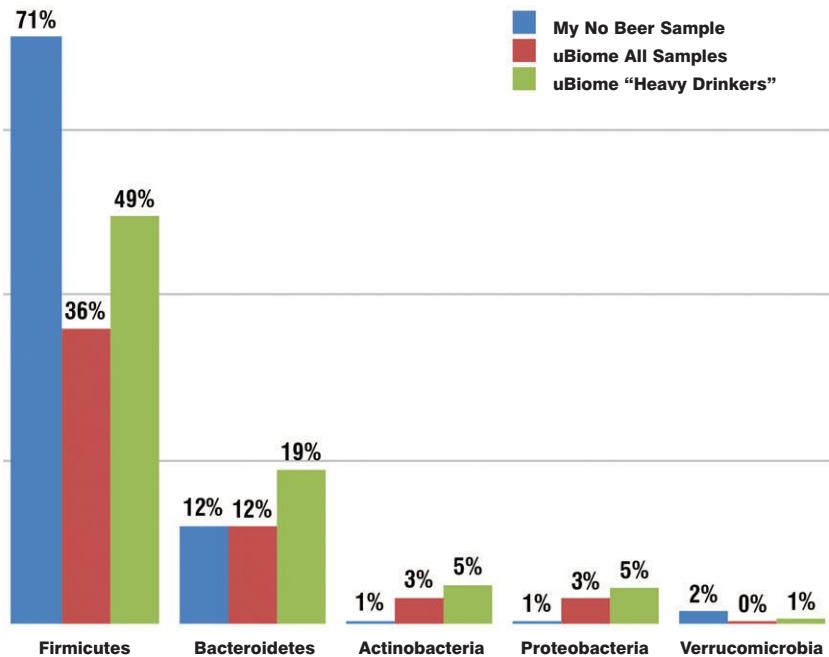
RESULTS AND DISCUSSION

The adult human, intestinal microbiome typically consists of six or seven bacterial phyla which, in total, amount to more than 10,000 different species⁴. Firmicutes

FIGURE 1:
uBiome Distal Gut Microbiome Kit



FIGURE 2:
uBiome Microbiome Analysis Examples



and Bacteroidetes represent the majority of microbial phyla in most Western (high protein, high fat) diets⁵. The relative abundances of the major bacterial phyla present in Matt's gut microbiome during the course of the experiment are presented in Figure 3, documenting a decrease in total Firmicutes with slight alterations in Bacteroidetes and Proteobacteria. Unfortunately, the number of unclassified bacteria increased, which may be a result of uBiome's methods.

It has been demonstrated that the ratio of Firmicutes to Bacteroidetes correlates with body weight, whereby a higher ratio (fewer Bacteroidetes) is found in those who are obese⁶. Bacteroidetes are thought to protect against obesity because they cannot digest fats, allowing them to pass through the digestive system. Thus there is an interest in identifying conditions that decrease this ratio. In Matt's microbiome samples, there appeared to be an increase in

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the ratio of Firmicutes to Bacteroidetes between the No Beer Diet and the 2-a-Day Saison Diet (Figure 4). The ratio returned closer to baseline after consumption of the Lacto-Saison.

The relative abundance of Bacteroidetes can be reduced with excessive alcohol intake. Chronic alcohol consumption and alcoholic liver disease have been linked to lower abundances of Bacteroidetes and higher Proteobacteria⁷.

In addition, another experiment evaluated the microbiome of mice whose diet was supplemented with 5 percent (v/v) ethanol for six weeks⁸. A decline of both Bacteroidetes and Firmicutes phyla was observed, with a proportional increase in Proteobacteria and Actinobacteria. One interesting speculation from Matt's microbiome data might be that even moderate consumption of beer reduces Bacteroidetes levels. However, in the study of chronic alcohol

consumption⁷, the bacterial genera that increased the most were *Alcaligenes* and *Corynebacterium*. No *Alcaligenes* were present in Matt's microbiome data and *Corynebacterium* was extremely minimal with very little change (Table 2), suggesting a difference in the effects of chronic versus moderate alcohol consumption on the microbiome.

Interestingly, Matt's Firmicutes/Bacteroidetes ratio returned closer to baseline after consumption of the Lacto-Saison (Figure 3). Might the presence of LAB in the beer further influence the microbiome? It has previously been reported that the addition of probiotics can actually improve some of the negative microbiome effects of chronic alcohol consumption, as administration of *Lactobacillus* attenuated ethanol-induced liver damage in mice⁹. This remains an interesting possibility for future experiments.

More specific changes to Matt's microbiome after the addition of beer can be observed at the Family and Genus level. The most abundant taxa and relevant probiotic taxa (*Lactobacillus* and *Bifidobacteriales*) are displayed in Table 2 with their relative abundances displayed as a percentage. Unfortunately no increases in *Lactobacillus* or *Bifidobacteriales* (both probiotics) could be observed in Matt's data (Table 2).

One noticeable observation is the high percentage of bacteria capable of complex carbohydrate digestion in the No Beer control. This is likely a reflection on Matt's diet which typically consisted of high fiber (Table 1) during and as part of his routine diet prior to the experiment. With the exception of *Blautia*, many of these bacteria were reduced after the addition of Saison or Lacto-Saison to the diet. Unfortunately there were few resident probiotic bacteria in Matt's microbiome with no appreciable effect on the population after the addition of Saison or Lacto-Saison.

While the results of this study cannot correlate moderate beer consumption with specific changes in the microbiome, they do highlight the complexity and importance of a balanced microbiome. Ultimately, changes in diet, including consumption of alcohol, can affect the microbial diversity in the

FIGURE 3:
Microbiome analysis data. Relative abundance of microbial phyla from the distal gut at the conclusion of each diet represented as a percentage.

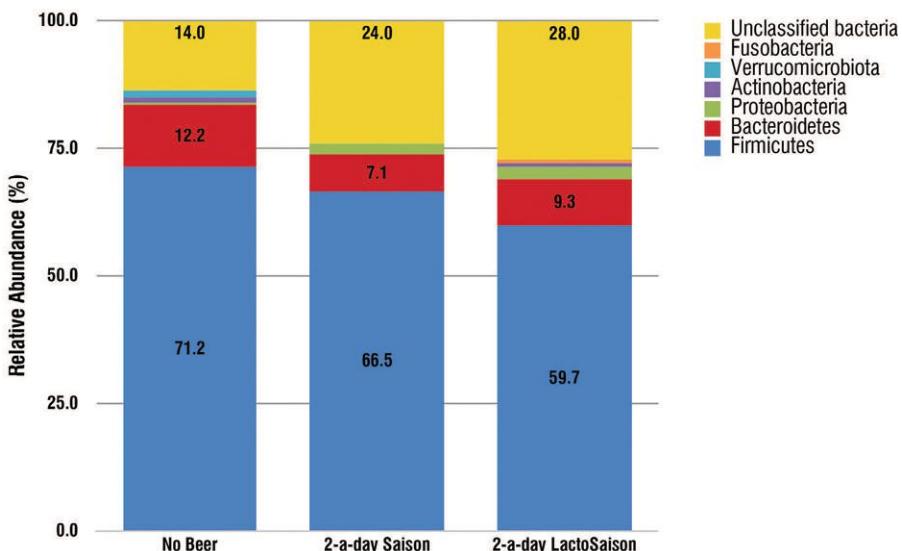
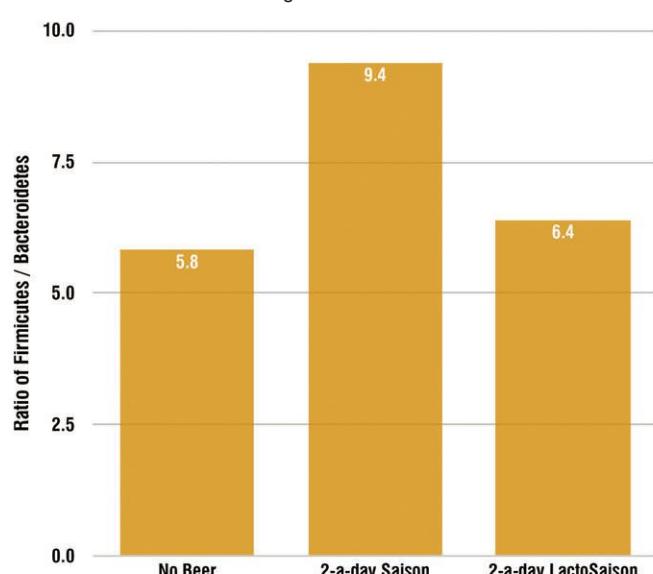


FIGURE 4:
Microbiome analysis data. The ratio between the relative abundance of Firmicutes /Bacteroidetes in the distal gut microbiome after each diet.





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TABLE 2:

Relevant bacteria in Matt's microbiome and their relative abundances during the experiment.

Phylum	Family or Genus	No Beer	Saison	Lacto-Saison	Average Healthy Omnivore	Descriptions (from uBiome)
Firmicutes	<i>Blautia</i>	14.14%	32.54%	24.54%	7.59%	- Indicates a healthy gut - Digests complex carbohydrates
Firmicutes	<i>Ruminococcus</i>	13.09%	3.93%	2.85%	6.36%	- Digests complex carbohydrates
Firmicutes	<i>Faecalibacteria</i>	6.38%	0.23%	0.15%	9.83%	- Digests complex carbohydrates - Reduced in Crohn's Disease
Firmicutes	<i>Roseburia</i>	6.01%	2.45%	1.09%	3.66%	- Indicates a healthy gut - Digests complex carbohydrates - Releases anti-inflammatory butyrate
Firmicutes	<i>Lactobacillus</i>	0.02%	0.01%	0.02%	0.70%	- Probiotic
Bacteroidetes	<i>Bacteroidaceae</i>	11.49%	4.68%	6.20%	9.8%	- Drops out in high fat diets - Alcoholics have fewer than general population - Diabetics have fewer than general population
Bacteroidetes	<i>Rikenellaceae</i>	0.02%	0.85%	1.62%	1.14%	- Indicates healthy gut - Thrives on high fat diets/enriched in obesity
Actinobacteria	<i>Bifidobacteriales</i>	0.29%	0.04%	0.03%	1.07%	- Probiotic
Actinobacteria	<i>Corynebacterineae</i>	0.00%	0.01%	0.02%		- Babies born via C-section tend to have more

gut. A few scientific studies of the microbiome have focused on chronic alcohol consumption, but greater focus is needed

on the benefits of moderate consumption. As an example, red wine has been shown to increase *Bifidobacterium* levels¹⁰. In another

study, fermentation of polyphenols by gut microbes indirectly stimulated proliferation of *Bifidobacteria* and decreased the ratio



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of Firmicutes to Bacteroidetes¹¹. Although this research did not focus on beer, beer is rich in polyphenols, many of which are derived from hops. Interestingly, dry hop additions were included in the Lacto-Saison, so perhaps this sample contained more polyphenols, which could explain the decreased Firmicutes to Bacteroidetes ratio in Figure 3.

Ultimately, this research raises the question of whether beer can be considered a probiotic beverage if it contains live-

culture LAB. The National Institutes of Health states that although promising research supporting probiotics and health has been reported, strong and significant evidence for the effects of probiotics on specific conditions is lacking, especially with long-term considerations. As such, the Food and Drug Administration has not approved any probiotics¹². Ultimately we cannot call live-culture beer a probiotic, but it remains a distinct possibility. In the future, careful research will be needed to examine not only the effect of

LAB-containing beer on the microbiome, but how total LAB cell numbers, and thus health benefits, might be increased without affecting beer flavor.

We are still a long way from understanding the potential health benefits of LAB beer on the microbiome, but this research has provided an interesting introspective on the possibility. We are excited to start the conversation of live-culture beer as a probiotic beverage, but clearly more scientific studies will be needed to validate the claim. We will conclude with an interesting question and possibility: What if a beer belly is created not solely by an increase in calories, but by alteration of the microbiome, such as an increase in gut microbes associated with fat adsorption?

THE GUTS OF THE REPORT

- Live-culture beer with lactic acid bacteria (LAB) might be considered a probiotic as similar LABs are used in yogurt, sauerkraut, and other fermented foods.
- Minor fluctuations in Matt's microbiome after consumption of two beers a day could be observed between the Saison and the Lacto-Saison. The Firmicutes to Bacteroidetes ratio increased with Saison consumption, but decreased with Lacto-Saison. High Firmicutes/Bacteroidetes ratios have been associated with obesity; thus from this data, the Lacto-Saison may be a "healthier" option.
- No changes in specific probiotic species could be detected in the microbiome, supporting the notion that probiotics need to be routinely consumed (in moderation) to provide health benefits.

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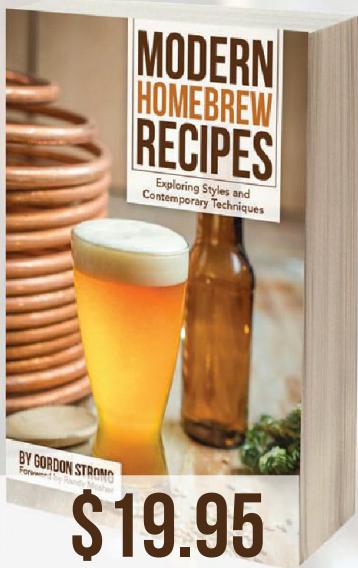
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ABOUT THE AUTHOR

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



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by Amahl Turczyn

Cherry Blossom Competition

The DC Homebrewers Club hosted its second annual Cherry Blossom Competition on March 21. According to president Bob Rouse, the club got its start in 2007, and its membership has been steadily growing. "We used to hold our monthly meetings in members' apartments," recalls Rouse, "but we outgrew that about three years ago, and now hold most of our meetings in local establishments. As DC is a very transient city, we have a membership that is always changing."

As evidence, he cites the 1,000-plus membership on his club's email list, with typically 30 to 50 members actually showing up for the monthly meetings. The attendance challenge in the busy metropolis is one he hopes to address. "One of our goals is to have all meetings accessible via the Metro train system, since a fair number of our members do not own cars."

The club has grown rapidly over the years, and only recently incorporated the National Cherry Blossom Festival into its increasingly popular annual competition, this year organized by Becky Ohlin.

Rouse explains, "This was only our second year hosting the competition. Prior to last year's inaugural event, the competition was an internal yearly 'club-only' competition. One of my goals when I became club president in 2013 was to host an AHA/BJCP-sanctioned competition. A Cherry Blossom-themed event seemed the best choice, since the annual DC event is well known. We added on the Cherry Blossom specialty category as a nod to its history with the club."

Judging was held at Meridian Pint, a beer-centric bar/restaurant in the Columbia Heights area of DC. "It has been a very



In 2015, 187 entries were judged in the Cherry Blossom Competition, which is able to draw from a talented pool of DC area judges.

friendly location for us, and has actually hosted its own homebrew competitions where the judging was by popular vote among attendees, and homebrewers served the beer they brewed," said Rouse. Meridian Pint catered the lunch for the judging, and provided the logistical support on the day of the event.

One advantage to being in DC is that it's never too difficult to find quality beer judges. "There is a great pool of BJCP judges in the DC/Baltimore area, so we have been blessed with excellence there," said Rouse. "We've limited entries to 240 until we get better at it, and two per person to ensure that any club member who wanted to enter

would have an opportunity to do so." As the event grows, so does the need for bigger and better prizes and sponsors. "We gained 501(c)(3) status last year, so hopefully that helped with our ability to attract donations."

Sanctioning the competition was another important step, but since then entries have steadily increased in number and creativity, particularly in the specialty category. Co-organizer Peter Jones added, "We have been BJCP sanctioned for two years. Both years we have hosted about 200 entries from all around the country, though most are local, from DC, Maryland, and Virginia. The format for both years has been similar across all beer categories (no cider or mead

Chodsko Pivo

Recipe by Shawn Scott
Best of Show, 2015 Cherry Blossom Competition

INGREDIENTS

for 7.5 U.S. gallons (28.39 L)

12.0 lb	(5.44 kg) Weyermann® Bohemian Pilsner malt
0.75 lb	(340 g) Weyermann® Munich II
0.75 lb	(340 g) Weyermann® Carafoam
1.06 oz	(30 g) Saaz Special, 6% a.a. (FWH)
1.06 oz	(30 g) Saaz Special, 6% a.a. (20 min)
1.06 oz	(30 g) Saaz Special, 6% a.a. (whirlpool)

Wyeast 2001 Urquell Lager and 2124 Bohemian Lager yeast (starters for each)

Dextrose sugar for priming

Original Gravity: 1.053

Final Gravity: 1.013

Boil: 90 min

SRM: 4.4

IBU: 26

Assumed Efficiency: 80%

DIRECTIONS

Mash in at 148° F (64° C) with 1.5 quarts/pound of grain. Heat to 161° F (72° C) and rest for 20 minutes. Heat to 170° F (77° C) and rest 15 minutes.

Open ferment at 48° F (9° C) for 12 days. Rest 48 hours at 60° F (16° C), then rack onto enough priming sugar to achieve 2.5 volumes of CO₂ in a sealed keg. Rest at 48° F (9° C) for two to three weeks before counter-pressure bottling. Lager at 33° F (1° C) for 30 days. Scott says, "Alternatively, one could bottle after the diacetyl rest in lieu of kegging."

"I typically wouldn't use any specialty malts when conducting the traditional decoction mash. If you have the time, it's worth the effort—but with modern malts, one can make a decent Pilsner using an infusion or step mash."

"I'm also blessed with naturally soft water, so brewers should take a good look at their water profile and either dilute with distilled or RO water, or lower the hop additions if they have significant sulfate levels."

"By the way, the Chodsko is a scenic region that borders Germany in western Bohemia."

EXTRACT VERSION: Omit Munich and Carafoam malts, and replace Bohemian Pilsner malt with 11 lb (4.99 kg) Pilsner malt extract syrup. Dilute with 100 percent distilled or reverse osmosis water.

yet), plus the Cherry Blossom category in which entrants should use flowers or flower derivatives (fruit or honey). Using cherries is encouraged; using cherry blossoms is a bonus. We've also had a variety of rose, hibiscus, jasmine, and other creative flower entries."

Jason Goodloe used both tart and sweet cherries in his creation, and his efforts

won him Best of Show in the specialty Cherry Blossom category. There was an element of serendipity to his victory, since he'd brewed the beer for himself, and only afterwards stumbled upon a local competition with a category seemingly tailor-made for his beer. Since Goodloe was interested in getting feedback to improve the quality of his beers, he entered his first BJCP competition.



Shawn Scott, winner of Best of Show at the 2015 Cherry Blossom Competition.

One suggestion that he found particularly helpful centered around carbonation. "Although I submitted the beer with about 2.5 volumes CO₂, the suggestion from the judges was to increase the volume. After trying this at 3.5 volumes CO₂, I would have to agree that the additional carbonation really adds to the beer."

Goodloe checked a couple of online sources for popular craft brews before lining up his cherry beer recipe. "When looking through BeerAdvocate's top beers, the top fruit beer was New Glarus Wisconsin Belgian Red. A friend from Wisconsin brought a few to taste. I was hooked and wanted to make something similar myself." He then found a few recipes that purported to be clones of his target craft beer. "I was able to find three recipes that got me started on the basis of the recipe." One was from a Brewing Network discussion, one was from a RateBeer post, and one came from the July/August 2007 Zymurgy, in which a guy named Amahl Turczyn Scheppach included a recipe attempt at New Glarus Wisconsin Belgian Red.

The overall Best of Show beer in the competition was a more traditional style: a Bohemian Pilsner brewed by Shawn Scott. If that name sounds familiar, it may be because Scott contributed a popular article on brewing traditional Grodziskie, also known as Grätzer, in the November/December 2012 Zymurgy. Scott began brewing way back in the golden years of the craft revolution: 1987.

Photo courtesy of Shawn Scott

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Belgian Cherry

Recipe by Jason Goodloe

Best of Show, Cherry Blossom Category, 2015 Cherry Blossom Competition

INGREDIENTS for 5 U.S. gallons (19 L)

3.0 lb	(1.36 kg) dry wheat malt extract
2.5 lb	(1.13 kg) dry golden malt extract
6.0 oz	(170 g) 40°L crystal malt
0.5 oz	(14 g) roast barley
1.0 oz	(28 g) aged Hallertau pellets (60 min)
49.0 oz	(1.39 kg) Vintner's Harvest Sweet Cherry Puree (secondary, 14 days)
80.0 oz	(2.27 kg) Kirkland Tart Montmorency Dried Cherries (secondary, 1 month)
Oak chips (secondary, 7-10 days)	
White Labs 500 Trappist Ale yeast	

Original Gravity: 1.050 (before cherries)

IBU: <10

DIRECTIONS

Age hop pellets two hours at 150° F (66° C). Steep crystal malt and roast barley in 150-152° F (66-67° C) water for 30 minutes. Drain, rinse grains, and dissolve extract completely to desired boil volume. Add aged hops and boil wort one hour. Chill to 68° F (20° C), pitch yeast and ferment 14 days, or until completion. Rack to secondary and add cherry puree and dried cherries tied into a mesh bag; allow to ferment for an additional month until activity slows. Add oak chips to secondary for the last 7-10 days. Remove solids and package.

ALL-GRAIN VERSION: Replace wheat extract with 5 lb wheat malt and golden malt extract with 4 lb pale two-row malt. Mash all grains at 150° F (66° C) for one hour, adding rice hulls if necessary to assist sparge.

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Recalls Scott, "A friend told me he knew how to make beer. It was an inauspicious start to say the least." But his curiosity was piqued, and he began reading up on the subject. "The big breakthrough came some months later, after I acquired some German malt, a pure liquid yeast culture, and a temperature controlled chest freezer. I'll never forget how wonderful that beer tasted. Needless to say, there was no going back after that."

As it happens with so many skilled brewers, inspiration comes from travel; there's nothing like sampling a traditional beer in its native homeland. Scott made his first trip to the Czech Republic in 1994. "I was enamored with their Pilsners, especially Pilsner Urquell. It's one of my favorite styles to brew and consume. I've made several visits there over the following years, and each visit inspires me to experiment with recipe formulation and mashing process to mimic that classic style."

Amahl Turczyn is associate editor of *Zymurgy*.

KUDOS—BEST OF SHOW

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August 2014

2014 New Mexico State Fair, 440 entries—
John Rowley with Paul McQuaid and Ghettoyle Greg,
Santa Fe, NM

September 2014

HAZtoberfest, 172 entries—Shannon Speight

October 2014

HOPS BOPS XXX, 177 entries—Josh Nacey

November 2014

Land of the Muddy Waters, 250 entries—
Tim Thomassen, Lincoln, NE

Badger Brewoff, 220 entries—David Worth,
Stoughton, WI

February 2015

2015 Joint Base Lewis-McChord (JBLM)
Homebrew Competition, 199 entries—
Jeremy Allison, Oak Harbor, WA

Sweethearts Revenge, 356 entries—Abe and Laura
Pilato, Loveland, CO

America's Finest City 2015, 585 entries—
Eric Shelley, San Diego, CA

Brew Classis, 107 entries—Chris Humble,
Lake Charles, LA

Baby, It's Cold Outside, 18 entries—Michael Wells,
Kansas City, MO

Reggale & DredHop, 380 entries—Ed Moore,
Highlands Ranch, CO

Newcastle Regional Show Brewers Championship,
58 entries—Mark Bigland

Beer Quest Triple Hop, 20 entries—Tim Thomassen
and Brian Hoesing, Lincoln, NE

Winter's Warmers, 50 entries—Jim Lachman,
Flourtown, PA

22nd Annual Peach State Brew-Off, 466 entries—
Wayne Otterbourg, Marietta, GA

Stout Bout, 29 entries—Charles Macaluso,
Portland, OR

March 2015

The Battle of Fredericksburg Homebrew
Competition, 294 entries—Gerard Filicka,
Richmond, VA

Garrison Brewing Home Brew Off, 84 entries—
David Martin, Halifax, NS

Bataille des Bières, 55 entries—Charlie Milan,
Baton Rouge, LA

Bockfest Cincinnati 2015, 50 entries—Andy Weigel,
Pittsburgh, PA

19th Annual Cascade Brewers Cup, 269 entries—
Dioni de Morena Morales, Redmond, WA

Pouring at the Coast, 57 entries—Charles Macaluso,
Saint Helens, OR

Shamrock Open XX, 420 entries—Michael Just,
Raleigh, NC

White Labs Yeast Comp, 27 entries—Damien Smith,
Perth, Western Australia

Lethbridge Werthogs 16th Annual WertContest,
191 entries—Alvaro Reyes, Vancouver, BC, Canada

Reinheits Revolt, 44 entries—Patrick Siebold,
Madison, WI

National Brewing Championships, 470 entries—
Richard Lubell

High Low Homebrew Competition, 47 entries—
Jose Lopez, Indio, CA

Club Only Porters and Stouts, 11 entries—
Crystal Davidson, Abingdon, VA

Rocket Rod Homebrew Competition, 233
entries—Duane Harens, Honaunau, HI

St. Patty's Day Stout Smackdown, 24 entries—
Stephane Turcotte, Busan, South Korea

Hudson Valley Homebrewers 25th Annual, 298
entries—Josh Youngman, Poughkeepsie, NY

SFHG St. Patrick's Day Homebrew Competition,
46 entries—Matt Ahlstrand, San Francisco, CA

Salmonid St. Paddy's Stout Challenge, 14 entries—
Jeff Olson, Salmon, ID

Suwanee Beer Festival Home Brewing
Competition, 250 entries—Bill Gillespie, Stone
Mountain, GA

Drunk Monk Challenge, 800 entries—Adi Hastings,
Chicago, IL

V Concurso Estadual da Acerva Paulista, 120
entries—Alexandre Xerxenevsky, São Paulo, Brazil

2014 CRAFT Invitational - Traditional Mead,
5 entries—Denise Kruczky, Macomb, MI

March Mashness, 180 entries—Tom Roan and
Nancy Bowser, Fargo, ND

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KUDOS—BEST OF SHOW

AHA/BJCP Sanctioned Competition Program

Los Angeles Belgian Brew Challenge, 90 entries—
Brian Holter and Kingsley Toby, Los Angeles, CA

Wolfgang Cup, 28 entries—Robert Ambler-Smith,
Cape Town, South Africa

People's Choice Award @ BBO Finals,
68 entries—Yeastie Boys - Bob, Rowlett, TX

Mazer Cup International Home Competition,
363 entries—Thomas Repas, Hermosa, SD

Wizard of Saaz 8, 400 entries—Marty Fischlin,
Parma Heights, OH

SNAFU Winterfest, 167 entries—Jimmy Doyle,
Las Vegas, NV

Slurp & Burp Open, 336 entries—Robert Blouch,
Aloha, OR

2015 House of Brews Pro-AM Challenge,
68 entries—Brian Phillips, Monona, WI

Ensenada Beer Fest, 97 entries—Pedernales,
Monterrey, Mexico

DC Homebrewers Club Cherry Blossom
Competition, 188 entries—Shawn Scott,
McAlester, OK

Bluebonnet Brew-Off, 1,327 entries—David Toups,
Houston, TX

24th Annual Charlie Orr Memorial Chicago Cup
Challenge, 538 entries—Scott Pointon, Crest Hill, IL

The Western NY Homebrew Competition "Amber
Waves of Grain," 640 entries—Robert Pilon,
West Seneca, NY

Steins' 1st Annual Home Brew Competition,
54 entries—Guillaume Brivet, Mountain View, CA

The IBU Open, 353 entries—Doug Karp, Wichita, KS

1st Annual Roaring Fork Beer Co Homebrew
Competition, 46 entries—Mike Kuenning,
Carbondale, CO

The Brew Hut 2015 Annual Homebrew
Competition, 272 entries—Jeffrey Selk, Denver, CO

April 2015

World Cup of Beer, 640 entries—Robert Horst,
Sacramento, CA

Battle of the Brew, 22 entries—David Allen,
Harlingen, TX

2015 Beans and Brews, 42 entries—Joel Smeriglio,
Palmyra, PA

Arizona Society of Homebrewers Springfest,
150 entries—Matt Brown, Tempe, AZ

Colonial Cup, 303 entries—Dexter Garner,
Lexington, NC

Alamo City Cerveza Fest, 298 entries—
Markus Haas, San Antonio, TX

Great Basin Brew-Off, 227 entries—Jeff Morrison,
Reno, NV

Upstate New York Homebrewers Assoc 37th
Annual Homebrew Competition, 290 entries—
Phil Boulanger, Rochester, NY

Bridging the Gap, 147 entries—Virg Redman,
Vacaville, CA

Belgian Beerfest, 63 entries—Mattias Isaksson,
Melbourne

23rd Spirit of Free Beer Homebrew Competition,
497 entries—Mark Girard, Annandale, VA

Old Town Clovis Home Brew Competition,
147 entries—Brad Gaines, Fresno, CA

Between the Bluffs Homebrew Competition,
94 entries—Steven Cook

Enchanted Brewing Challenge, 296 entries—
Kevin Fleming, Albuquerque, NM

San Mateo County Fair Homebrewed Beer
Competition, 147 entries—Rusty Hopewell,
Belmont, CA

Erie County Fair Home Brew Competition,
111 entries—John Crossett, North Tonawanda, NY

Wort Hog Brewers Summer Beer Festival 2015
Competition, 33 entries—Anthony Wilkins,
Waldt Brewery, Johannesburg, Gauteng

Mead Free or Die (professional), 183 entries—
Jon Talkington, Seaford, DE

Rhythm and Brews Festival, 30 entries—Brad Sayles

Upland Brewing Company UpCup, 66 entries—
Chris Hoover, Shelbyville, IN

Nebraska Shootout Inter-Club Competition,
66 entries—Tom Hawk, Omaha, NE

Snow Goose Spring Break-up Home Brew Comp,
10 entries—Mike Cragen, Anchorage, AK

London and South East Craft Brewing
Competition 2015, 240 entries—Avoda Ivrit,
Gilad Ne-Eman, Israel

The Bruery - BATCH # Competition,
91 entries—Kevin Osborne, North Hollywood, CA

May 2015

The Patagonian Brewing Experience, 47 entries—
Chris Clair, West Chester, PA

18th Annual Cactus Challenge, 252 entries—
Cristina Bailey and Aaron Rogers, Lubbock, TX

The advertisement features three books by Charlie Papazian:

- THE COMPLETE JOY OF HOME BREWING** (FOURTH EDITION) - Fully revised and updated.
- THE HOME BREWER'S COMPANION** (SECOND EDITION) - Fully revised and updated.
- MICROBREWED Adventures** - A unauthorized journey into the home brewing world, featuring more than 50 brewery recipes.

Below the books, there are two additional titles:
FOR THE ADVANCED BREWER and **ON THE ROAD WITH CHARLIE**.

American Homebrewers Association®

Rally!

Join us at an AHA Rally near you:

June 27 | Nebraska Brewing Company | La Vista, NE

July 12 | Monday Night Brewing Company | Atlanta, GA

July 12 | Keegan Ales | Kingston, NY

July 16 | Samuel Adams Brewery | Boston, MA

July 16 | Yards Brewing Company | Philadelphia, PA

July 26 | Cigar City Brewing | Tampa, FL

August 23 | Bent Paddle Brewing Company | Duluth, MN

See the Events section of HomebrewersAssociation.org for an up-to-date calendar

AHA RALLIES — Fun celebrations of the local homebrewing community, hosted by Brewers Association member breweries. Enjoy tours, samples, prizes and meet beer enthusiasts and homebrewers in your area.

HomebrewersAssociation.org

Entrance to an AHA Rally is always free for AHA members; non-members may attend by joining the AHA on-site at a discounted rate.



2015 Napa Homebrewers Classic, 85 entries—
Mike Riddle, Napa, CA
VanBrewer Awards, 378 entries—Hiroshi Tsukada,
Vancouver, BC, Canada
19th Annual B.E.E.R. Brew-Off, 133 entries—
Wally Kopinski, Buffalo, NY

Copa Cervezas Vendimia UC, 118 entries—
Jester Luptopia, Conchali, Santiago, Chile
Any Lager Club Only #1-5, 7 entries—
Mike Sheehan, Abingdon, VA

AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

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



July 11
Amador County Fair Homebrew Competition
Plymouth, CA.
Entry Deadline: 6/27/2015.
brewangels.com

July 11
Indiana State Fair Indiana Brewers' Cup Competition
Indianapolis, IN.
Entry Deadline: 6/27/2015.
in.gov/statefair/fair/contests/2560.html

July 11
Sunshine Challenge
Winter Springs, FL.
Entry Deadline: 5/28/2015.
cfhb.org

July 11
2015 Ohio Brew Week Homebrew Competition
Athens, OH.
Entry Deadline: 6/26/2015.
obw.brewcomp.com

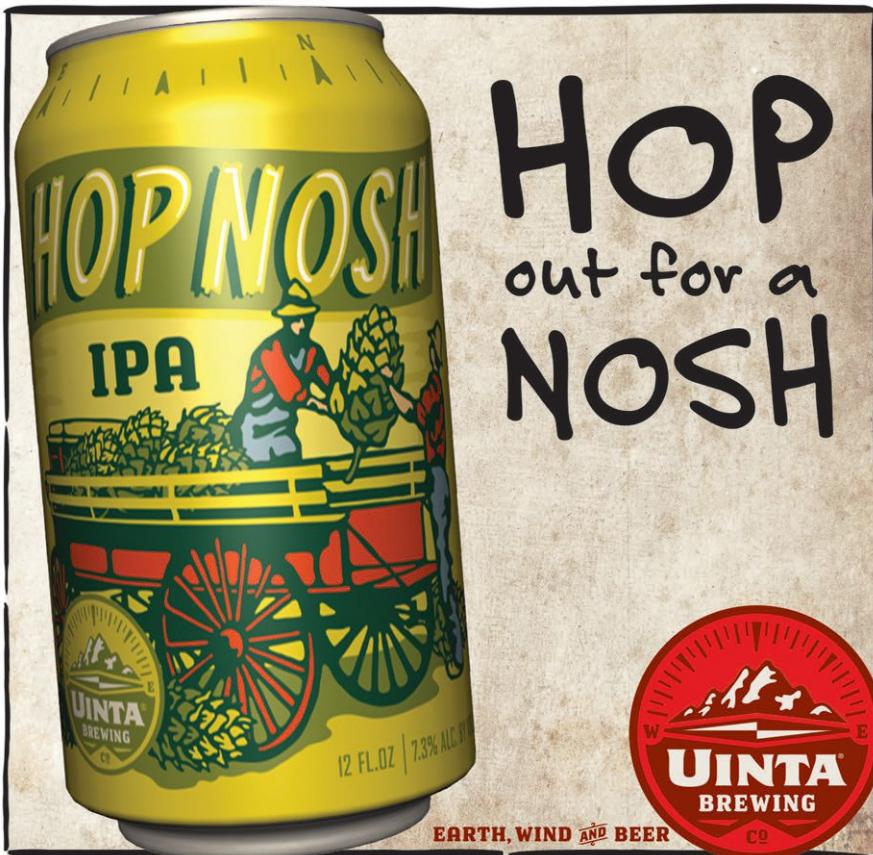
July 14
GTA Brews Summer Club Competition
Toronto, ON.
Entry Deadline: 7/11/2015.
gtabrews.ca/seasonalcomp/

July 18
Antelope Valley Fair
Lancaster, CA.

July 18
Deer River Bar-B-Que & Brewfest
Deer River, MN.
Entry Deadline: 7/17/2015.
deerriver.org/events/event.php?number=116

July 18
E.T. Barnette Homebrew Competition
Fox, AK.
Entry Deadline: 7/15/2015.
mosquitobites.com/Den/Beer/Events/Events.html#ETB

Continued on page 78 >



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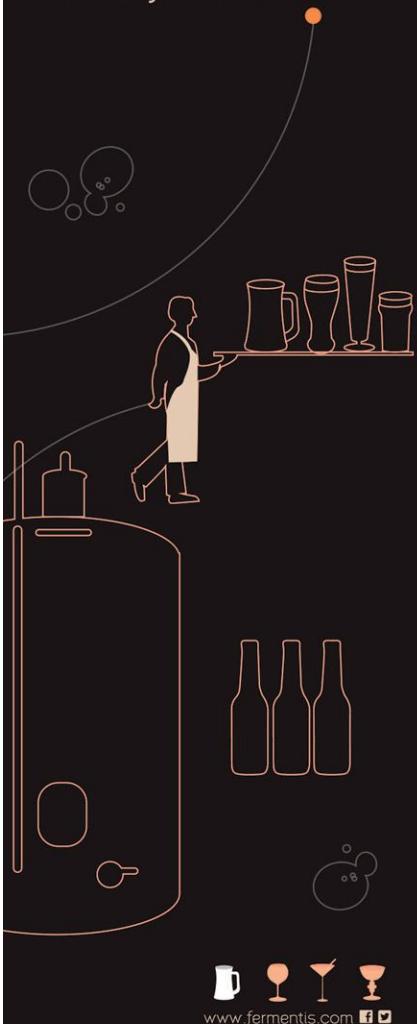
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Homebrew shops: see our homebrew shop distributors at www.fermentis.com/brewing/homebrewing/distributors/#AMERICAS

AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

July 18

2015 Humpback Homebrew Competition
Ocean Springs, MS.
Entry Deadline: 7/10/2015.
competitions.gulfcoastbrewersleague.com

July 18

ESB 2015 Home Brew Competition
Sydney, NSW, Australia.
Entry Deadline: 7/11/2015.
esbcomp.wordpress.com

July 18

El Paso County Fair Homebrew Competition
Calhan, CO.
Entry Deadline: 7/12/2015.
elpasocountyfair.brewcompetition.com

July 18

Clark County Fair
Springfield, OH.
Entry Deadline: 6/30/2015.
clarkcoag.com

July 18

Santa Clara County Fair Home Brew Competition 2015
San Jose, CA.
Entry Deadline: 7/8/2015.
thefair.org

July 24

National Beer Trophy
Cape Town, Western Cape, South Africa.
Entry Deadline: 7/20/2015.

July 25

Brew Haven Homebrew Competition
New Haven, IN.
Entry Deadline: 7/18/2015.
beercomp.triontavern.com

July 25
German Fest Stein Challenge
Milwaukee, WI.
Entry Deadline: 7/10/2015.
steinchallenge.com

July 25

Crystal Coast Brew Off - CCBO
New Bern, NC.
Entry Deadline: 7/18/2015.
atfhomebrewclub.com

July 25

Hail the Ale
Manhattan, KS.
Entry Deadline: 7/22/2015.
rhythmandbrewsmhk.org

July 25
1st Annual Adams County Fair Homebrew Competition
Northglenn, CO.
Entry Deadline: 7/3/2015.
adamscountyfair.org

July 25

All American Brew Off - 6th Annual
Fort Smith, AR.
Entry Deadline: 7/11/2015.
rivervalleyaleraisers.com

July 25

Fugetaboutit
Chattanooga, TN.
Entry Deadline: 7/8/2015.
fugetaboutit.barleymob.com

July 25

New Jersey State Fair Homebrew Competition - 19th Annual
Augusta, NJ.
Entry Deadline: 7/11/2015.
scubabrewclub.com

July 25

Arvada On Tap - Homebrew Competition
Arvada, CO.
Entry Deadline: 7/19/2015.

July 30

For What It's Worth
Bloomington, IL.
Entry Deadline: 7/11/2015.
forwhatitswort.com

July 31

Denver County Fair Home Brew Competition
Denver, CO.
Entry Deadline: 7/30/2015.
denvercountyfair.org

August 1

Concurso Cervejeiro Caseiro Bierland
Blumenau, SC, Brazil.
Entry Deadline: 5/16/2015.
bierland.com.br

August 1

Dominion Cup
Richmond, VA.
Entry Deadline: 7/18/2015.
jrhb.org

August 1

Summer Smash 3
Tucson, AZ.
Entry Deadline: 7/25/2015.
buffalobrewclub.brewcomp.com

August 1

Canfield Fair Homebrew Competition 2015
Canfield, OH.
Entry Deadline: 7/10/2015.
canfieldfair.com

August 1

2015 Michigan Beer Cup
Auburn Hills, MI.
Entry Deadline: 7/17/2015.
michiganbeercup.com

August 1

Delaware State Fair Homebrew Competition
Harrington, DE.
Entry Deadline: 7/18/2015.
delmarvabrewers.blogspot.com/p/blog-page_9.html

August 1

Clash of the Carboys
Baton Rouge, LA.
Entry Deadline: 7/10/2015.
redstickbrewmasters.com/clashofthecarboys/

August 1

National Capital Homebrew Competition
Ottawa, ON, Canada.
Entry Deadline: 7/24/2015.
nationalcapitalhomebrew.tumblr.com

August 2

Ventura County Fair Amateur Home Brewing Competition
Ventura, CA.
Entry Deadline: 8/1/2015.

August 2

McHenry Rotary Blues, Brews and BBQs
McHenry, IL.
Entry Deadline: 7/23/2015.
mchenryrotarybluesbrewsandbbqs.com

August 8

6th Annual Beehive Brew-Off
Salt Lake City, UT.
Entry Deadline: 8/2/2015.
beernut.com/beercomp/

August 8

LHG Homebrew Competition
London, ON, Canada.
Entry Deadline: 7/31/2015.



AHA/BJCP SANCTIONED COMPETITION PROGRAM CALENDAR

August 8
Oregon State Fair Homebrew Beer Competition
 Salem, OR.
 Entry Deadline: 7/31/2015.
oregonstatefair.org/competitions/

August 8
Black and Brews: A Roller Derby Brew-Off
 Longmont, CO.
 Entry Deadline: 8/1/2015.
facebook.com/events/1585318621731103/

August 14
Kentucky State Fair Homebrew Competition
 Louisville, KY.
 Entry Deadline: 7/1/2015.
kystatefair.org

August 15
Babble Brew-Off: America's Cup
 Wheeling, IL.
 Entry Deadline: 8/8/2015.
brewoff.brewcomp.com

August 15
MoM Hot Summer Brew Off
 Kansas City, MO.
 Entry Deadline: 8/7/2015.
missourimashers.com/hot-summer-brew-off/

August 15
First Coast Cup 2015
 Jacksonville, FL.
 Entry Deadline: 7/22/2015.
thecask.org/fcc.htm

August 21
Minnesota State Fair Homebrew Competition
 Saint Paul, MN.
 Entry Deadline: 8/7/2015.
mnstatefair.brewcomp.com

August 22
New South Brew Off
 Clarksville, TN.
 Entry Deadline: 8/7/2015.
clarksvilletcarboys.com/NSBO/2015/

August 22
Beer and Sweat
 Erlanger, KY.
 Entry Deadline: 8/12/2015.
bloatarian.com/bbl-competitions/beer-sweat/

August 22
3rd Annual Macon Beer Festival Home Brew Competition
 Macon, GA.
facebook.com/themaconbeerfest

August 22
The Limbo Challenge
 Richardson, TX.
 Entry Deadline: 7/31/2015.
limbocomp.org

August 23
Washington State Fair
 Puyallup, WA.
 Entry Deadline: 8/15/2015.
thefair.com

August 28
Colorado State Fair Homebrew and Craft Beer Competitions
 Pueblo, CO.
 Entry Deadline: 8/8/2015.
coloradostatefair.com

August 29
Midwest Brewer's Brawl
 La Porte, IN.
 Entry Deadline: 8/9/2015.
brewersbrawl.com

August 29
Battle of the Beers
 Virginia Beach, VA.
beachambassadors.com

September 4
Competencia Amateur - Cerveza Mexico 2015 (Ronda Final)
 Mexico DF, Distrito Federal, Mexico.
 Entry Deadline: 8/5/2015.
copacerveza.mx

September 5
II Concurso Sul Brasileiro de Cervejas Caseiras
 Blumenau, Santa Catarina, Brazil.
 Entry Deadline: 8/28/2015.
concurso-bjcp.org/sulbrasileiro/

September 5
Schooner Homebrew Competition
 Racine, WI.
 Entry Deadline: 8/22/2015.
theschooner.org

September 11
3rd Annual Grace Lutheran Bier Brauen
 Sandy, UT.
 Entry Deadline: 9/05/2015.
gracesandy.org

September 12
Picnique Belge
 North Kansas City, MO.
 Entry Deadline: 9/1/2015.
graingtglass.biz

September 14
Santa Cruz County Fair Homebrew Competition
 Watsonville, CA.
 Entry Deadline: 8/1/2015.
zymurgeeks.org

September 19
Tulsa State Fair Homebrew Competition
 Tulsa, OK.
 Entry Deadline: 9/11/2015.
tulsastatefair.com

September 19
Texas Meadfest Competition 2015
 Gruene, TX.
 Entry Deadline: 9/1/2015.
texasmeadfestcompetition.org

September 19
Queensland Amateur Brewing Championship
 Brisbane, Queensland, Australia.
 Entry Deadline: 9/5/2015.
qabc.org.au

September 26
2015 Maryland Microbrewery Festival Homebrew Competition
 Westminster, MD.
 Entry Deadline: 9/12/2015.
mdmicrobrewfest.brewcompetition.com

September 26
HAZtoberfest
 Erie, PA.
 Entry Deadline: 9/12/2015.
brewcompetition.hazardhomebrewing.org

September 26
Aurora - Dearborn County Brewoff
 Aurora, IN.
 Entry Deadline: 9/5/2015.
gbeer.com

September 26
Pacific Brewers Cup
 Los Angeles, CA.
 Entry Deadline: 9/11/2015.
pbc.pacificgravity.com



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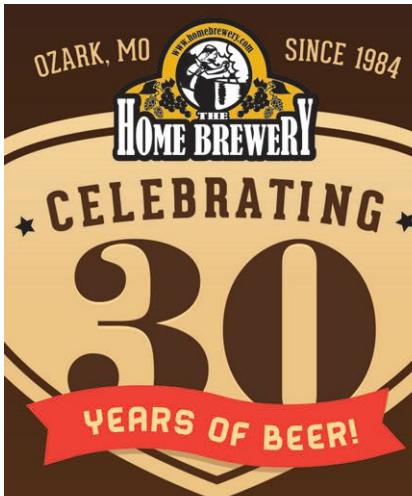
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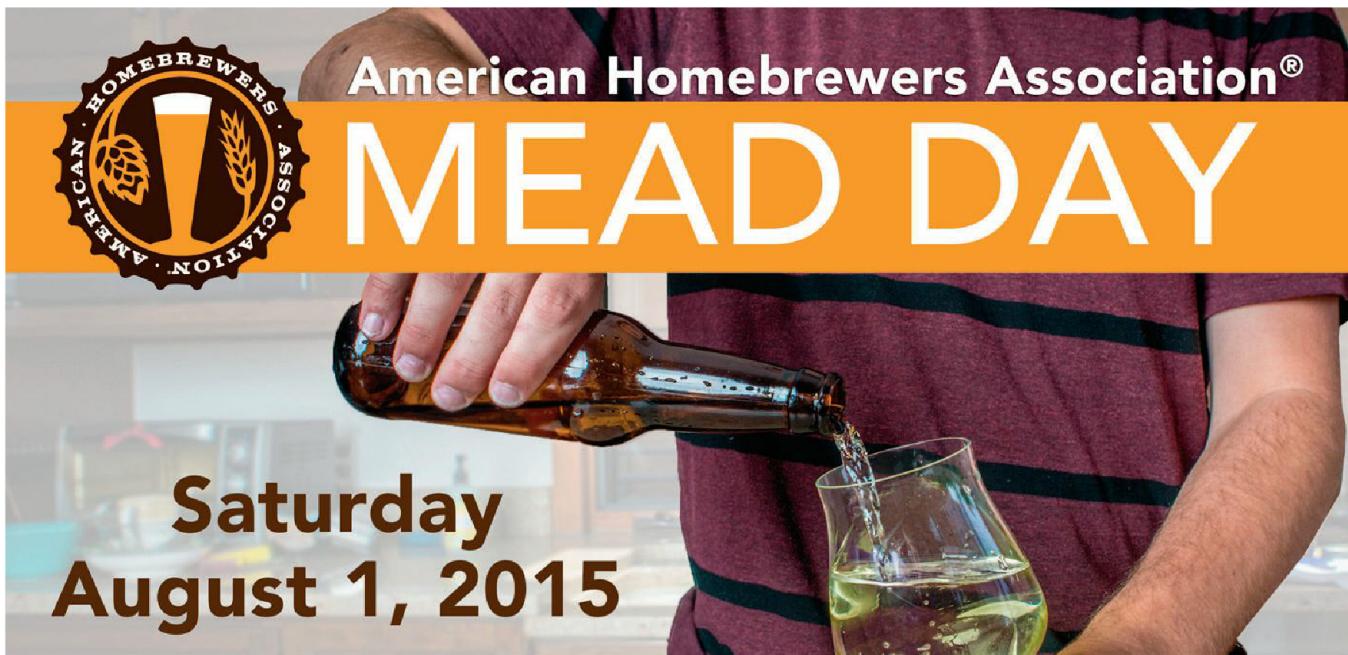


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HomebrewersAssociation.org



COMMERCIAL CALIBRATION

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



Our judging panel continues to immerse itself in the 2015 BJCP Style Guidelines, exploring Category 21B: Specialty IPA. The new category covers black, brown, white, Belgian, rye, and red IPA.

We found two popular specialty IPAs to send to our judges: Deschutes Chainbreaker White IPA, and Grand Teton Bitch Creek Extra Special Brown.

Chainbreaker White was originally conceived as a collaboration (Conflux #2) between Deschutes Brewery and Boulevard Brewing Co. “We combined Boulevard’s expertise of wheat and Belgian brewing with our passion and knowledge of hops,” commented Deschutes brewmaster Brian Faivre in an article

on White IPAs in the July/August 2012 Zymurgy. Deschutes then tweaked the recipe to create Chainbreaker White. (For a Chainbreaker White IPA clone, see the July/August 2012 issue.)

Chainbreaker White is brewed with wheat and Pilsner malt. Citrusy aromas from Cascade and Citra meld with the esters of Belgian yeast. Sweet orange and coriander are added to spice things up. Chainbreaker White is 5.6 percent ABV and 55 IBUs.

Grand Teton Brewing Co. in Victor, Idaho, brews an ESB: Extra Special Brown. Bitch Creek ESB is named for the spring-fed stream that flows out of the west side of the Grand Tetons and runs through southeastern Idaho and western Wyoming. The beer is brewed with two-row malted barley, German melanoidin, CaraAmber, CaraAroma, and CaraMunich, and hopped with Galena, Chinook, and Centennial. It checks in at 6 percent ABV and 60 IBU.

Bitch Creek “perfectly balances big malt sweetness and robust hop flavor for a full-bodied, satisfying mahogany ale,” according to the brewery’s website.

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.



Grand Teton Brewing Co.
grandtetonbrewing.com

Deschutes Brewery
deschutesbrewery.com

BJCP Style Guidelines
bjcp.org

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

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THE SCORES



Bitch Creek ESB—Grand Teton Brewing Co., Victor, Idaho
BJCP Category: 21B, Specialty IPA (Brown IPA)

THE JUDGES' SCORES FOR BITCH CREEK ESB



DAVE HOUSEMAN



BETH ZANGARI



SCOTT BICKHAM



GORDON STRONG

Aroma: Toffee and caramel malt up front with moderate citrus and pine hop aroma. General fermentation fruity esters with berry and stone fruit character. No DMS. No diacetyl. Low to medium-low alcohol aroma. Overall very pleasant but more malt focused than hop focused. (9/12)

Appearance: Bright clarity. Red-brown color. Dense, rocky, long-lasting, tan head. Beautiful beer. (3/3)

Flavor: Chocolate, toffee, and caramel malts with moderately high hop bitterness that balances the residual malt sweetness. Minerally, chalky notes, especially in the after-taste. Lingering bitterness. Fruity fermentation esters mostly reminiscent of prunes and raisins. Hop flavor is more earthy and piney with low citrus notes. No DMS or diacetyl. Alcohol quite noticeable. (15/20)

Mouthfeel: Medium body with a fuller mouthfeel due to the mineral-chalky aspect combined with lingering hop astringency. Moderate alcohol warming. Overall the finish is a bit harsh. (3/5)

Overall Impression: The hop bitterness places this beer in the IPA category but the bigger chocolate and toffee malt character have it straddling the IPA and American Brown Ale categories. While the beer is quite drinkable, the chalky-malt bitterness is not as refreshing as other examples of the style. This beer would go well with a burger and onion rings. (6/10)

Total Score: (36/50)

Aroma: Spicy, pepper, and piney hop aroma plays behind moderately pronounced coffee and nutty malt with low notes of Crenshaw melon. A rock candy sugar note emerges, then retreats, leaving a hint of toast in its wake. (10/12)

Appearance: Deep reddish brown with brilliant ruby highlights, topped with a creamy, persistent off-white foam. Large bubbles emerge as the foam falls, leaving its imprint on the sides of the glass. (3/3)

Flavor: Firm malt backbone constructed of coffee, toast, and a bit of caramel carries esters of black currant and sun-dried prunes. Hop flavor presents with a compelling, elegant bitterness, though the piney, peppery flavor is subdued. This hop character balances well with the dried fruit and malty sweetness. Follows with a moderately dry, lingering pleasant bitterness and toasty-ness. (17/20)

Mouthfeel: Medium bodied with firm, somewhat spritzy carbonation. Not creamy or astringent. A low alcohol warmth lingers in the finish. (5/5)

Overall Impression: This beer makes me a little nostalgic. Styles like this emerged from homebrewer experimentation; I remember evaluating many similar samples over the years that were just not right in any category, but were quite lovely. The toasty, coffee malt, and sweet dried fruit balanced by a fairly assertive hop bitterness has finally found a more appropriate style designation. It does exhibit characteristics of a Brown Ale, but the distinctly American citrus piney hop variety is all IPA. (8/10)

Total Score: (43/50)

Aroma: Initially earthy, with a moderate grainy malt character. A little roasted malt, with a touch of cacao and coffee. Woody and tobacco notes emerge. Fermentation esters are subdued; some light floral (hibiscus) notes. (9/12)

Appearance: Deep copper color with brilliant clarity. Some sediment in the bottle. Crown of large bubbles encircles a layer of smaller, tight bubbles. Very good retention. (2.5/3)

Flavor: Smooth malt profile with low to medium notes of caramel, toffee, and biscuit. Light chocolate and coffee notes emerge, but overall malt character lacks depth and complexity. Hop flavor is medium high, with characteristic English notes—earthy and tobacco-like with a little grassiness. Low esters; flowery notes. Pronounced bitterness. Balance is certainly toward the hops, with just enough malt backbone for support. (15.5/20)

Mouthfeel: Some prickliness from the moderately high carbonation. Medium body, with residual sweetness. Slight alcohol warmth, followed by a light astringency from the hops and roasted malts. (4/5)

Overall Impression: An enjoyable foray into the Brown IPA style. The hop bitterness is pleasant without sacrificing the integrity of the underlying style. A little more malt complexity would improve the balance and finish. The English hop varieties give pleasant earthy and woody notes that form a bridge between the caramel and toasted malts and the long, pronounced bitterness in the finish. (8/10)

Total Score: (39/50)

Aroma: Big chocolate malt aroma, has a dark chocolate quality with moderate caramel and some grainy notes. Medium-light earthy-floral hops follow and grow as it warms. Hint of alcohol and an impression of sweetness. Seems fairly clean. Bready malt qualities say "English" to me. Hops are more of a bright accent than anything else, as the malt is dominant. (9/12)

Appearance: Deep coppery-brown color with mahogany highlights. Moderate-sized beige head with good persistence. Slight haze, but the beer is nearly opaque. (3/3)

Flavor: Like the aroma, lots of chocolate, some caramel, and a bready-grainy quality. High bitterness, smooth palate. Substantial malt masks bitterness until mid-palate. The bitterness suggests baker's chocolate. Sweetness initially, and has a caramel flavor. Restrained floral hops, slightly bright, with a touch of citrus-pine in the after-taste. Bitter chocolate and lingering hop bitterness. Slightly harsh at the end. (15/20)

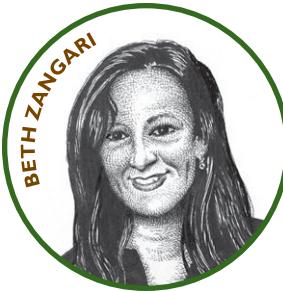
Mouthfeel: Medium body, pushing medium-full, a bit much. Creamy-thick. Light grainy astringency and warming but somewhat subtle. Medium-high carbonation. (4/5)

Overall Impression: Chocolate qualities and bitterness put it in this category, although the finishing hops are a bit light. Body slightly big, which hurts drinkability. Malt flavors are quite English, with chocolate, bready, and caramel, but no roast. The malt dimension can probably be dialed back a touch to make it a bit more IPA-like. (7/10)

Total Score: (38/50)



THE JUDGES' SCORES FOR CHAINBREAKER WHITE IPA



Aroma: Citrus hops with notes of grapefruit and orange up front with general fermentation fruitiness. Low clove-like phenols in the background. Very light Pils-like malt with a bit of breadiness. No to low alcohol present in aroma. No diacetyl or DMS. Very inviting. (10/12)

Appearance: Cloudy like a wit. Yellow, a bit darker than the typical wit and within range for a White IPA. Dense, rocky, white, long-lasting head. (3/3)

Flavor: Fruity with fermentation esters and citrus hop flavor. Noticeable clove-like phenols. High hop flavor with medium-high hop bitterness. Pils-like bready malt provides balancing sweetness to the hop bitterness. No diacetyl or DMS but alcohol is more noticeable in flavor than aroma. Well balanced with assertive but restrained hop presence in the dry aftertaste. (18/20)

Mouthfeel: Soft palate to mouthfeel with some lingering but restrained bitterness and hop astringency. Medium body. Very low alcohol warming. Well attenuated. (5/5)

Overall Impression: This interpretation of the White IPA style is quite complex without the “over the top” bitterness that many IPAs try to achieve. Very well balanced with the overall feel of an IPA. Phenols add to the complexity and sense of a wit beer, but more body and mouthfeel than the typical wit. This very drinkable beer will go well with many foods, from Brussels mussels to spicy Thai to the backyard barbecue. I’m a convert. (8/10)

Total Score: (43/50)

Aroma: First impression is tutti-frutti with a hint of bubblegum; leamy hop aromas take over, along with a bit of floral and clove at equal level. The mélange of fruit, floral, and spice dominate the somewhat spicy, bready grist profile. (10/12)

Appearance: Pale straw with a frothy, fluffy white persistent foam stand. Rather hazy, but fluffy. (2/3)

Flavor: Light bready, wheat-y malt is low in the background, supports pronounced zesty lemon and grapefruit hop flavors, with floral spicy mid-notes. Hop flavor dominates at first, then gives way to moderate bitterness. Low yeast and clove notes sneak in at the end, followed by a hint of apricot. Lemon lingers in the finish. (18/20)

Mouthfeel: Medium bodied with creamy carbonation and a light astringency. Very low alcohol warmth accents a tingling citrus zest on the tongue. (5/5)

Overall Impression: Bright, fresh, and zesty. Has the floral coriander and citrus zest notes of a wit bier without getting lost behind the pronounced citrus hop floral and bitterness. This is one style I could stock in my refrigerator all summer. (8/10)

Total Score: (43/50)

Aroma: Smoked ham leaps to the forefront, but fades into a blend of fruity, floral, citrusy, and spicy notes. Sweet honey notes along with a hint of bubblegum esters from the Belgian yeast. Lush tropical fruits, more citrus, and coconut emerge later, giving it a piña colada character. Hops are understated. (10/12)

Appearance: Moderately hazy with the suspended yeast and proteins lending an attractive sheen to the straw-colored beer. Fairly tight white bubbles linger nicely on the surface. (3/3)

Flavor: Well-balanced, with wheat malt contributing light sweetness and backbone. Tropical fruit esters are more subdued than in the aroma, but add notes of mango, pear, and papaya. Citrus notes are more akin to coriander spice than orange peel. Slight soapiness is the only negative, but this fades into assertive hop bitterness appropriate to an IPA. Hop flavor is very low, emphasizing yeast esters and spices. (17/20)

Mouthfeel: Moderately high CO₂ leaves a slight tingle on the tongue along with a slight acidity. Residual sweetness. Low alcohol warmth is evident, and a little astringency coats the mouth with a slightly chalky texture. (4/5)

Overall Impression: A pleasant beer that balances the Belgian wit character (wheat, coriander, yeast esters) with the bitterness of an IPA. The flavor and aroma hops are kept low, emphasizing the key elements of the two styles. A little muddled; could be a little smoother. The smoky bacon aroma may linger a little too long for some tasters. (7/10)

Total Score: (41/50)

Aroma: Spicy hop aroma, moderately high. Moderate citrus fruitiness; oranges mostly. Some fresh herbal-green notes. Hints of alcohol add to the spice. Bright leamy notes follow. Clean and moderately intense, the spicy-herbal hop notes and bright citrusy accents are inviting. As it warms, the fruitiness becomes more tropical—intriguing. (10/12)

Appearance: Medium yellow color. Significant haze gives it a reflective, whitish cast. Tall white head, frothy-rocky, fairly persistent. Looks like a witbier. (3/3)

Flavor: Bready-wheaty flavor initially but rapidly overcome with moderately-high herbal-spicy hop flavor and medium-high bitterness. Dry but full finish. Slight alcohol aftertaste, evaporative, with bitterness and hop flavor most noticeable. Medium citrusy flavor, oranges, and lemons, with a slight acidic bite at the end. The fruit develops some tropical notes as it warms. (17/20)

Mouthfeel: Medium-full body, a bit too heavy. Thick, creamy, mouthfeel. High carbonation. Lightly warming. Slight hop astringency. (4/5)

Overall Impression: The body seems kind of heavy but the balance is otherwise enjoyable. Fresh, bright hops, citrus-tropical notes, and wheat flavors pair well. Alcohol is restrained but noticeable. Bitterness and hops tag it as an IPA and the citrusy-wheat parts provide the witbier flavor. Dryness helps but it would be more enjoyable with less body, especially if consumed in hot weather. (8/10)

Total Score: (42/50)

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by Charlie Papazian



Retro Roastaroma Brown Ale

One of the biggest problems I have with homebrewing is that after 45 years, I've developed so many great beer recipes that there isn't enough time to revisit some of the greatest. I continue to create new beers, and one of the most popular things that homebrewers do is share their knowledge and recipes.

As I related in the January/February issue of *Zymurgy*, my fourth edition of *The Complete Joy of Homebrewing* was published in late 2014. I really wanted to include some of my more recent recipes, but was faced with the not-so-easy task of retiring some of the long-appearing ones. In their place, I added new recipes such as 400 Rabbits, Brighella Milano Sour Golden Ale, Carla's Oat Brown Ale, Dancing with Hops IPA, Hopothesis Rosemary Xtra Pale Ale, Maverick India Black Ale, Mayahuel – Lady of the Tortoise Throne Ale, Purposefully Saison, and Wild Women American IPA.

One recipe I retired from the earlier editions was Roastaroma Deadline Delight, a dark brown ale brewed from a Celestial Seasonings tea then called Roastaroma® Mocha Spice. It was a great beer that was very popular in the earlier days of the homebrewing renaissance during the 1980s. This beer helped introduce the idea (extreme in those days) of adding herb and spice blends to flavor beer. Homebrewers loved it. Maybe it's worth loving again. Here's a modernized version of the original recipe that will enable you to go back in time and taste an experience that helped change the paradigm of what beer could be.

Here's the original *Complete Joy of Homebrewing* description:



Here's an unusual recipe and an unusual beer inspired by an herbal tea whose basic ingredients are crystal malt and roasted barley. Roastaroma® Mocha Spice tea is packaged by Celestial Seasonings. Its contents, besides having the above-mentioned traditional beer ingredients, have a host of other herbs and spices, including star anise and cinnamon. The hearty aroma of this tea suggested a worthwhile experiment. And indeed it is a favorite of my beer-drinking friends. (If you've actually read every recipe so far, you can tell I have made a lot of friends.)

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As detailed by Professor Surfeit in "Dear Professor" (page 15), the tea (now just called Roastaroma®) is no longer available as loose tea, but is instead available in tea bags. Professor Surfeit recommends using

the tea bags (cut them open to measure out the loose tea) or making your own blend. Let's cut the shuck and jive and get on with the recipes.

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

Retro Roastaroma® Deadline Delight 2015

ALL GRAIN RECIPE

INGREDIENTS

for 5 U.S. gallons (19 L)

7.5 lb	(3.4 kg) two-row pale malt
12.0 oz	(340 g) crystal malt (10° L)
5.0 oz	(142 g) debitterized black malt
4.0 oz	(113 g) Gambrinus Honey malt
1.25 oz	(35 g) whole Vanguard hops, 5.5% a.a. (6.9 HBU/193 MBU) 60 min
1.0 oz	(28 g) Cascade hop pellets, 5.5% a.a., 2 min
2.0 oz	(57 g) or 28 teabags Celestial Seasonings Roastaroma® herbal tea (One teabag = 2 grams), 2 min. Remove the tea from the teabags. Or blend your own approximation (see "Dear Professor" on page 15).
0.25 tsp	(1 g) powdered Irish moss (10 min)
Yeast	American Ale yeast or White Labs Cry Havoc yeast
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity: 1.048 (12° P)

Target Extraction Efficiency: 78%

Approximate Final Gravity: 1.012 (3° P)

IBUs: about 31

Approximate Color: 23 SRM (46 EBC)

Alcohol: 4.8% by volume

DIRECTIONS

A step infusion mash is employed to mash the grains. Add 9 quarts (8.6 L) of 140° F (60° C) water to the crushed grain, stir, stabilize and hold the temperature at 132° F (56° C) for 30 minutes. Add 4.5 quarts (4.3 L) of boiling water and add heat to bring temperature up to 155° F (68° C) and hold for about 30 minutes. Raise temperature to 167° F (75° C), lauter and sparge with 3.5 gallons (13.25 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 add the Irish moss. When 2 minutes remain add the 2-minute hops and Roastaroma® tea or custom blend. After a total wort boil of 60 minutes turn off the heat and place the pot (with cover on) in a running cold-water bath for 30 minutes. Continue to chill in the immersion or use other methods to chill your wort. Strain and sparge the wort into a sanitized fermenter. Bring the total volume to 5 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). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and if you have the capability "cellar" the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

Retro Roastaroma® Deadline Delight 2015

MALT EXTRACT RECIPE

INGREDIENTS

for 5 U.S. gallons (19 L)

3.0 lb	(1.36 kg) light malt extract syrup or 2.6 lb (1.2 kg) dried light malt extract
3.0 lb	(1.36 kg) dark malt extract syrup or 2.6 lb (1.2 kg) dried dark malt extract
12.0 oz	(340 g) crystal malt (10° L)
5.0 oz	(142 g) debitterized black malt
1.5 oz	(42 g) whole Vanguard hops, 5.5% a.a. (6.9 HBU/193 MBU) 60 min
1.0 oz	(28 g) Cascade hop pellets, 5.5% a.a., 2 min
2.0 oz	(56 g) or 28 teabags Celestial Seasonings Roastaroma® herbal tea (one teabag = 2 grams), 2 min. Remove the tea from the teabags. Or blend your own approximation (see Dear Professor on page 15).
0.25 tsp	(1 g) powdered Irish moss (10 min)
Yeast	American Ale yeast or White Labs Cry Havoc yeast
0.75 cup	(175 ml) corn sugar (priming bottles) or 0.33 cup (80 ml) corn sugar for kegging

Target Original Gravity: 1.048 (12° P)

Target Extraction Efficiency: 78%

Approximate Final Gravity: 1.012 (3° P) **IBUs:** about 31

Approximate Color: 23 SRM (46 EBC) **Alcohol:** 4.8% by volume

DIRECTIONS

Place crushed grains in 2 gallons (7.6 L) of 155° F (68° C) water and let steep for 30 minutes. Strain out (and rinse with 3 quarts [3 L] hot water) and discard the crushed grains reserving the approximately 2.5 gallons (9.5 L) of liquid to which you will now add malt extract and 60 minute hops. Bring to a boil.

The total boil time will be 60 minutes. When 10 minutes remain add Irish moss. When 2 minutes remain add the 2-minute hops and Roastaroma® tea or custom blend. After a total wort boil of 60 minutes, turn off the heat. Immerse the covered pot of wort in a cold water bath and let sit for 15 to 30 minutes or the time it takes to have a couple of homebrews.

Strain out and sparge hops and direct the hot wort into a sanitized fermenter to which 2.5 gallons (9.5 L) of cold water has been added. If necessary add cold water to achieve a 5 gallon (19 L) batch size. Aerate the wort very well.

Pitch the yeast when temperature of wort is about 70° F (21° C). Ferment at about 70° F (21° C) for about one week or when fermentation shows signs of calm and stopping. Rack from your primary to a secondary and if you have the capability "cellar" the beer at about 55° F (12.5° C) for about one week. Prime with sugar and bottle or keg when complete.

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The Real Cost of a Homebrew

In his article “Is Homebrewing Cost Effective?” in the November/December 2014 issue of *Zymurgy*, Don Simpson presents a brilliantly conceived look at the “payback” period for homebrewing equipment, and arrives at what an economist might term the marginal (or incremental) cost of 5 gallons of homebrew. Reading that article inspired me to pull out a scratchpad and do the kind of calculations I had done for 25 years as a cost analyst—I’d just never done them for homebrewing before.

I applied the same rules that people use for deciding whether to go into (or stay in) the business of brewing. That means that we should depreciate our investment in equipment over its economic life, and roll it into our cost of production. This is a lot easier than it sounds.

In order to compute the cost of 12 ounces of homebrew, I made some conservative assumptions about the typical homebrewer. This hypothetical brewer happens to look a lot like me, just maybe not as frugal: an all-grain brewer who purchases equipment rather than fabricating it; bottles the beer; and brews 12 times a year.

I am assuming that he or she brews 5 gallon batches with a typical Gott cooler mash system, has a fairly decent 10 gallon kettle (with ball valve and thermometer) with a jet style propane burner, and has all the necessary equipment to support this style of brewing: several carboys in various sizes with a temperature controller and a fermentation heater, lots of bottles, and a bench capper. I calculated that the required investment is approximately \$1,357. I’ve been brewing for more than 25 years, and I still have the same equipment that I started with. Unless you break a carboy, this stuff lasts a long time. So I assigned a 40-year lifespan to the equipment. Depreciating \$1,357 over 40 years, at 12 brewing sessions a year, results in an equipment cost per 5 gallon batch of \$2.83.

Certain annual expenses are incurred on a yearly basis, such as siphon tubing, cleaning materials, and sanitizing chemicals. These come to about \$27 a year. Dividing these costs over 12 batches resulted in \$2.25 per 5 gallons.

For the direct costs of grain (pre-crushed), liquid yeast, hops, priming sugar, propane, and bottle caps, I conservatively estimated \$46 for a fairly robust recipe, which unfortunately can’t be divided by anything but are actual costs per batch. For the sake of argument, I set labor costs to zero.

Thus for a 5 gallon batch, we have depreciation expenses of \$2.83, annual expenses of \$2.25, and direct expenses of \$46,



for a grand total of \$51.08. Considering that we can get about 53 bottles per 5-gallon batch, this yields 96 cents per 12-ounce bottle. Mainstream suds will cost you about 63 cents per bottle (by the case) and craft brew about \$1.38.

My conclusion is that we enjoy our homebrew for less than a dollar (or about a dollar if we keg) per 12-ounce serving, and that doesn’t begin to account for the sheer joy we all get out of the hobby, which, as they say in the credit card commercials, is priceless.

John Dura is retired after 25 years’ employment with Ma Bell and her progeny. He has been homebrewing for about 25 years, and lives with his wife, Mary, his daughter, Emily, and his dog, Angus. Only Angus shows the least bit of interest in John’s passion for brewing.



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