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HOLIDAY
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VOL 42 • NO 6 NOVEMBER/DECEMBER 2019



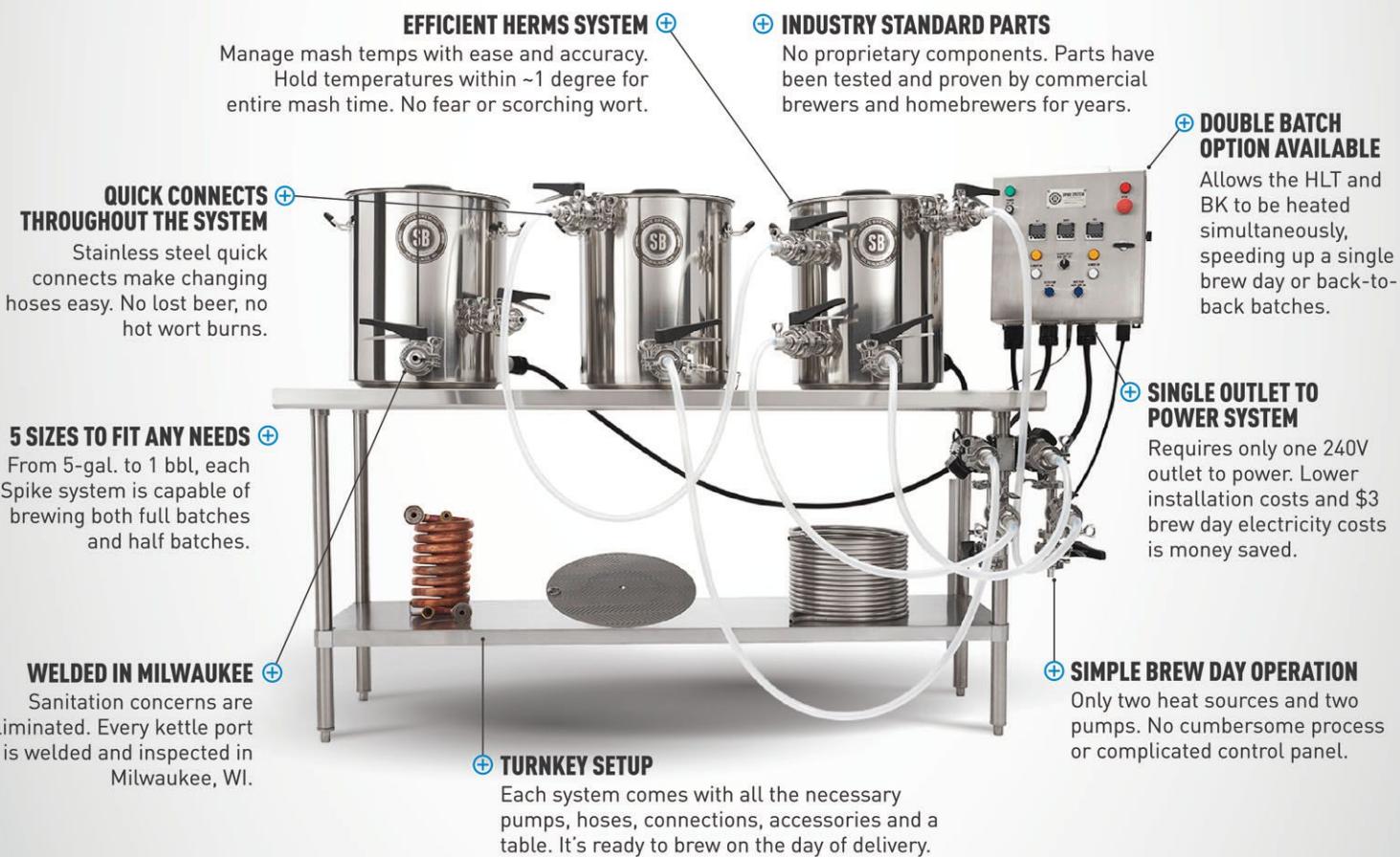
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ASK THE STAFF

The holidays are coming up. Name one of your favorite or most memorable beer and food pairings.

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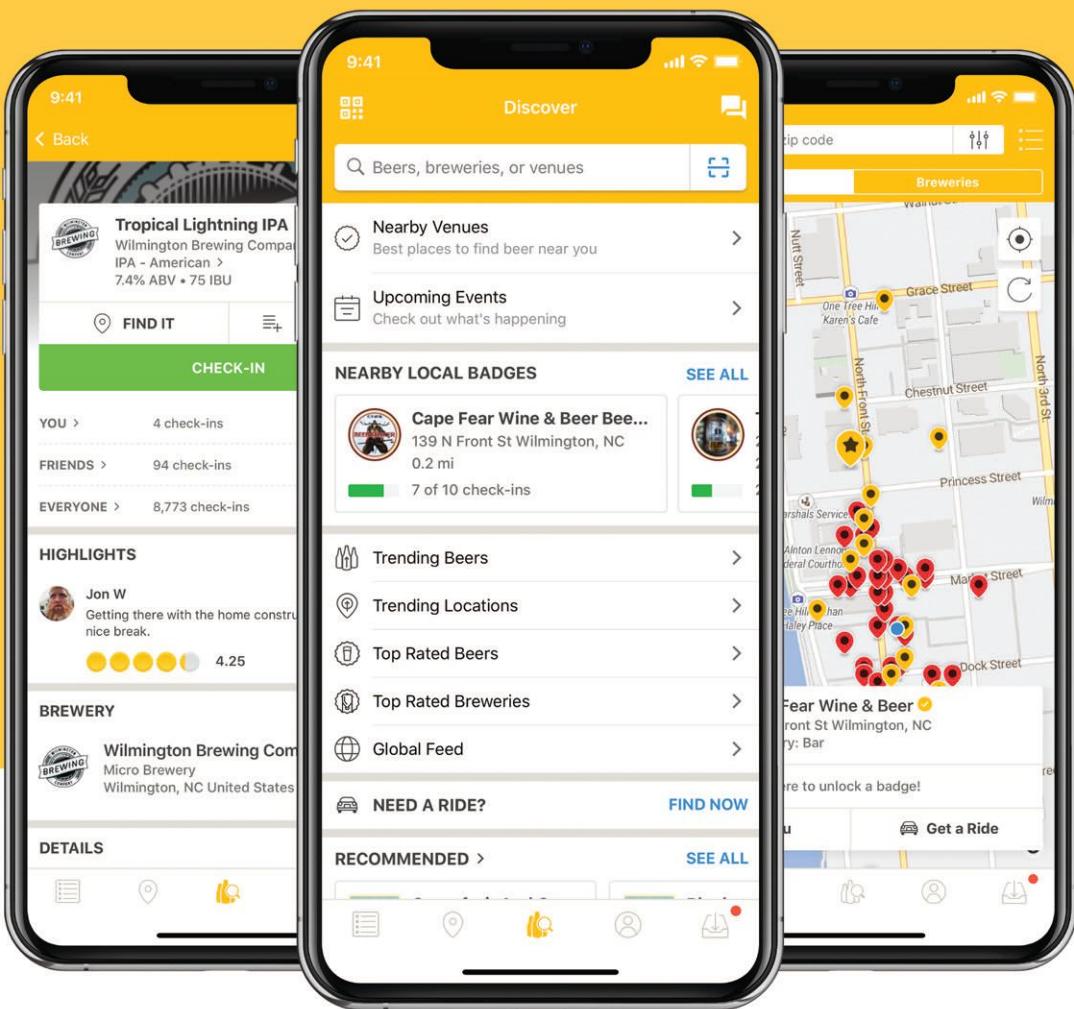
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Go Local

FC's *Portlandia* owes much of its success to the egalitarian manner with which leads Fred Armisen and Carrie Brownstein skewer society's crunchier, trendier elements. The scene may be set in Portland, but the sketches could just as easily play out in Austin, Boulder, San Francisco, or Seattle. If you can easily drop the name of your town, Mad Libs-style, into the phrase "Keep _____ weird," *Portlandia* probably strikes close to home.

In the series's pilot episode, Peter and Nance (played by Armisen and Brownstein) sit down to dine at a farm-to-table restaurant, where they proceed to pepper the server with questions about the provenance and living conditions of the chicken listed on the menu. We learn that he "is a heritage breed, a woodland raised chicken, that's been fed a diet of sheep's milk, soy, and hazelnuts" and that his name is (was) Colin.

All trends can be silly when taken to the extreme (remember when the surest way to make a beer fly off the shelves was to endlessly amp up the IBUs and ABV?), but satirical extremes notwithstanding, the trend toward increasingly local sourcing of products has virtue. Choosing to shop locally puts money back into your community and reduces the environmental, logistical, and financial overhead associated with freight. And when you choose to shop at your local homebrew store, you support a business that offers unique and irreplaceable benefits.

COMMUNITY SUPPORT

Naturally, shopping at your local store means that your homebrew dollars directly support members of your community. The person working behind the counter, who may well be the shop's owner and sole employee, depends on the support of a thriving homebrew base to keep operations running. But there's much more at play here than simply helping a small business keep its doors open.

Homebrew shops play a vital role in the health of the local beer scene. Some serve as de facto headquarters for one or more



homebrew clubs. Most offer a valuable knowledge base in the form of recipe ideas, staff experience, and recommendations on equipment and ingredients. The best ones offer a fun place to simply hang out with like-minded hobbyists. How many times have you walked into your favorite shop to just pick up a quick packet of yeast or bag of hops, only to find yourself engaged in a lively discussion an hour later?

SELECTION AND ADVICE

You and I both recognize that an independent brick-and-mortar store will rarely be able to compete with large retailers on price. The economic advantages of volume simply do not favor small businesses, and confusing sales tax laws that make it easy to shop online without paying local tax further exacerbate the situation. Your local shop will almost never win on cost.

What your local homebrew store *can* offer, however, is a selection of unique products that may not be available on the national stage. Take craft malt. The last five years have seen an explosion in the number of small maltings, many of which grow, malt, and package grain within a very small radius. These maltings often have a minuscule distribution footprint of just a few postal codes, and you simply can't find their products beyond the area in which they operate.

Your local shop can also offer advice that is specifically tailored to your situation. Homebrew shops in Colorado understand

the challenges of kegging at high elevation (see Ask the AHA on page 23 of this issue). A shop in the upper Midwest might have insight into dealing with hard water. Shops in Florida may offer creative solutions for chilling wort.

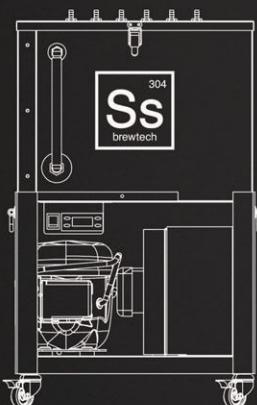
UNIQUE SERVICES

Anyone who owns and operates a kegerator or keezer must periodically refill their CO₂ cylinder. This is not really an option online, and anyone who has had to deal with an industrial gas supplier understands that these companies often don't want to bother with the little 5- or 10-pound tanks homebrewers use. Many homebrew supply shops offer convenient CO₂ fills and swaps while you do your shopping. Some even fill nitro cylinders with beer gas, the 70/30 blend of nitrogen and carbon dioxide that fuels stout faucets.

Finally, most homebrew shops are more than willing to special order items they wouldn't normally stock. You simply need to let them know about the obscure yeast strain or specialty malt you have in mind, and they'll usually be able to get it for you.

Not everyone lives near a homebrew store, but if you do, I encourage you to pay it a visit. Whether it's your first trip to the shop or your 50th, you can feel good about supporting a unique small business that depends on homebrewers like us. Cheers to that!

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



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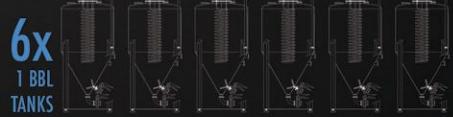
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BREWING WITH HONEY

Honey's value in brewing derives from its functionality and flavor. It offers brewers a unique and often hyper-local story to tell about their beer, a story of terroir, floral source, and even the importance of honey bees to our entire food system.

By Keith Seitz



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PAST THE FINISH LINE

All the time and effort spent perfecting your favorite homebrew recipe can be compromised in just the few seconds it takes to pour a beer. These tips and resources on properly serving beer will get you past the finish line.

By Andrew Luberto



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ENGINEERING BETTER BEER AND MEAD

Engineers tend to share a keen ability to succinctly organize data, are drawn to orderly processes, and are driven to solve problems, especially those that result in the creation of something usable (or delicious). Perhaps that's why so many of them homebrew.

By Melissa Dempsey



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ZYMURGY'S 2019 HOLIDAY GIFT GUIDE

Not sure what to buy for the homebrewer on your list (or for yourself)? Here are 27 new or noteworthy items for all experience levels and budgets. Your 2020 resolution to brew more beer starts here.

By The editors of Zymurgy

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By Dave Carpenter



FROM THE GLASS

Celebrate Learn to Homebrew Day

By Gary Glass



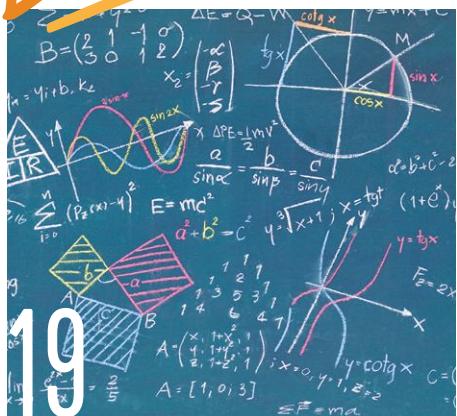
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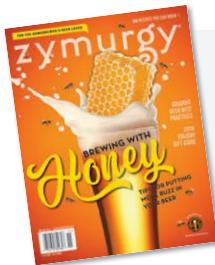
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Composite by Jason Smith

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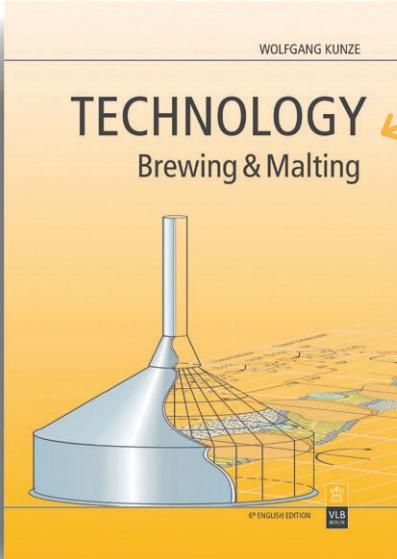
(zī'mərjē) n: the art and science of fermentation, as in brewing.



ON THE WEB

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NOW ON Tap



New (Old) Book

**TECHNOLOGY BREWING & MALTING,
6TH EDITION, BY WOLFGANG KUNZE**

In June, the Versuchs- und Lehranstalt für Brauerei in Berlin (VLB) e.V. published the sixth English-language edition of Wolfgang Kunze's *Technology Brewing & Malting*. First published in 1961 and available in seven languages, this textbook has become a standard reference for students of brewing and malting around the world. Some ambitious homebrewers even dive into the techy tome. With nearly 1,000 pages of content, it's not a book to be finished in one sitting. But those who want to learn how things are done in modern production breweries will be richly rewarded.

Although Kunze died in 2016, his will stipulated that VLB would continue to incorporate new technology into future editions of this classic volume.

For more information, visit vlb-berlin.org/books.

Shop News

NORTHERN BREWER SOLD

▲ NORTHERN BREWER



In July, an affiliate of Blackstreet Capital Holdings (BCH), LLC, acquired homebrew store Northern Brewer from ZX Ventures, the self-described "global growth and innovation" arm of Anheuser-Busch InBev that also owns RateBeer.com.

"This transaction brings Northern Brewer back to its roots as an independent supplier of high-quality kits, ingredients, and equipment," said Murry Gunty, CEO of BCH. "We are excited to partner with Northern Brewer and to continue its tradition of serving the craft beer industry since 1993."

Melissa McConn, Director of Queen of Beer (left) and Jenn McPolland, Director of SheBrew PDX (right).



Perfect Pairing

QUEEN OF BEER AND PINK BOOTS SOCIETY

Queen of Beer began in 1994 as a small homebrew club competition and has grown into a nationally recognized homebrew competition for women brewers. This year, competition organizers have partnered with the Pink Boots Society, an international organization that supports women in professional brewing. The part-

nership aims to support and encourage future women of the craft beer industry.

"Pink Boots Society is excited to be working with the Queen of Beer competition!" said Laura Ulrich, president of the Pink Boots Society. "We love seeing the increase of women in beer. Events like these are filled with inspiration,

“
We love
seeing the
increase of
women in
beer.

— Laura Ulrich,
president of the Pink Boots Society

→ providing the perfect environment for women to realize a true passion and find the motivation to take it to the next level. Queen of Beer has led the way in providing excellent feedback and support to female homebrewers over the years. Pink Boots Society hopes to continue to show the importance of bringing women together and lifting them into the production of beer as a profession.”

Queen of Beer 2018 Jessica Finlay-Schultz brewed her winning Finlay's Rye Pale Ale with Fort Rock Brewing of Rancho Cordova, Calif., as a Great American Beer Festival (GABF) Pro-Am entry. She encourages women to enter Queen of Beer 2019.

“Gender inclusivity in the homebrewing community is growing, but women’s competitions are still important to have,” she said. “These competitions have inspired women in my homebrew club, Foam on the Range, to start doing women-only brew days. We’re working on expanding to invite women from other clubs as well.”

This year’s Queen of Beer winner will brew a GABF Pro-Am entry with Drake’s Brewing Co. of San Leandro, Calif. Competition winners will also be awarded scholarships to UC Davis and the Siebel Institute of Technology.

The Queen of Beer competition will be held December 14, 2019. For more information, please visit queenofbeer.beer.

Club News

FIRST ANNUAL LONG ISLAND MEAD FESTIVAL

By Andrew Luberto

This past National Mead Day (Saturday, August 3, 2019), the first annual Long Island Mead Festival was held in Lindenhurst, N.Y. The brainchild of W A Meadwerks co-owners Joe Abruzzo and Roger Wanner, it was a first-of-its-kind event for Long Island.

Held in the Lindenhurst town square and gazebo, the sold-out event featured tables for eight commercial meaderies, two distributors (including Mutiny Distribution, the country’s only mead-exclusive distributor), the Long Island Beekeepers Club, five area homebrew clubs, and a VIP-only table serving meads donated from around the country. The chamber of commerce organized live bands, food trucks, street vendors, and even a bouncy house!

The event also featured an audience choice award for best homemade mead, a competition organized between Long Island clubs Brewers East End Revival, Homebrews and Handgrenades Craft Beer Club, and the Long Island Beer and Malt Enthusiasts. The vote was close, but victory went to Danielle and Russell Malone with Don’t Poke the Doughboy, a semisweet clover honey mead with cinnamon and vanilla.



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→ “Danielle and Russ are regulars and early supporters of W A, so we couldn’t be more pleased to see them win,” said Joe Abruzzo.

Planning for next year is already underway, with an expected increase in attendance and participation



Don't Poke the Doughboy

Semisweet mead



Recipe courtesy Danielle and Russell Malone

Batch volume: 5 U.S. gal (18.9 L)

Original gravity: 1.075 (18.2°P)

Final gravity: 1.020 (5.1°P)

Alcohol: 7.3% by volume

HONEY

10 lb. (4.54 kg) clover honey

YEAST

1.2 pkg Lalvin D-47

ADDITIONAL ITEMS

6.25 g Go Ferm for hydrating yeast

2.5 tsp. (12 mL) potassium sorbate, added in week 5

3.43 g Fermaid O, added to primary on day 1

6 vanilla beans, split, added to secondary in week 8

3.43 g Fermaid O, added to primary on day 2

6 cinnamon sticks, added to secondary in week 8

3.43 g Fermaid O, added to primary on day 3

5 oz. (142 g) vanilla puree at bottling

3.43 g Fermaid O, added to primary on day 7 or when gravity is 1.049

1.5 Tbsp. (22 mL) cinnamon extract at bottling

0.25 tsp. (1.2 mL) potassium metabisulfite, added in week 5

BREWING NOTES

Rehydrate yeast with 6.25 g Go Ferm in 125 mL (4.2 oz.) water. Mix honey in fermenter with approximately 4.2 gal. (15.9 L) water to yield 5 gal. (18.9 L) must. Pitch yeast and ferment at 68°F (20°C), adding Go Ferm to primary as indicated above.

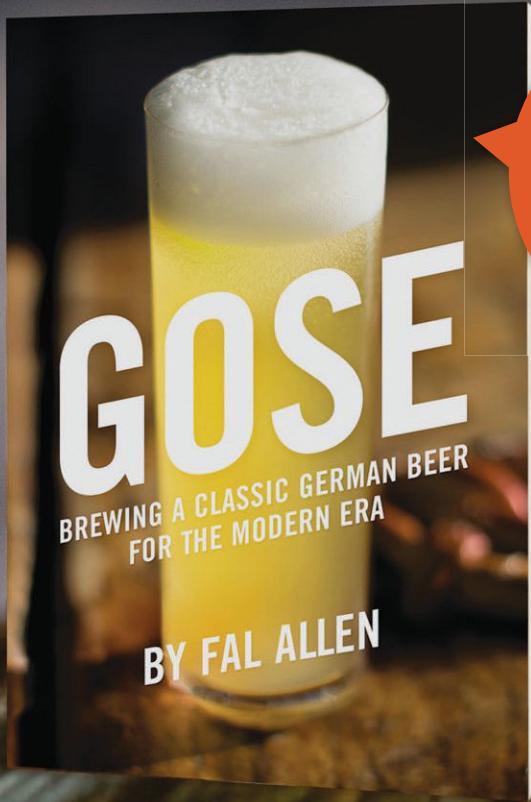
On week 5, reduce temperature to 57°F (14°C), rack to secondary, and add potassium metabisulfite and potassium sorbate. On week 8, add cinnamon sticks and vanilla beans. About 1 week before serving (week 14), remove cinnamon sticks and vanilla beans and rack to keg with vanilla puree and cinnamon extract. Carbonate, serve, and enjoy.

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CELEBRATE Learn to Homebrew Day

November 2 is the 21st annual AHA Learn to Homebrew Day. Since 1999, the AHA has encouraged homebrewers to teach their uninitiated friends, family, and neighbors how to brew beer on the first Saturday of November. I'm sure you all will agree that the world would be a better place to live if there were more homebrewers among us. So, do your part by participating in Learn to Homebrew Day this November 2.

Find details on the event, including event registration, a map of registered sites, and resources for beginning brewers on the

Learn to Homebrew Day web page. Find it under Events on HomebrewersAssociation.org.

Something to keep in mind is that homebrewing can be intimidating for newbies. As fun as it is to show off our elaborate brew systems, they probably aren't the best way to introduce beginners to the hobby. When teaching new brewers, I highly recommend keeping things simple by brewing a stovetop extract batch. This method requires the least amount of knowledge and minimal equipment, and it is less intimidating than all-grain brewing. It also takes a lot less time.

SUPPORT YOUR LOCAL HOMEBREW SHOP

Recent news of some venerable homebrew supply shops closing offers a good reminder of how important it is to support your local shop. On September 8, Houston's legendary DeFalco's Home Wine & Beer Supplies, first opened in 1971 and owned since 1980 by industry veteran Scott Birdwell, closed for business.

On Labor Day weekend, Nancy Rigberg and George Hummel, longtime owners of Philadelphia's Home Sweet Homebrew, shut down their downtown storefront, which had been in business since 1986. Though the couple have alternative business plans in the works, it's sad to see another brick-and-mortar homebrew shop close. In Longmont, Colo., where I live, Brewmented

closed in early September after just a year and a half in business.

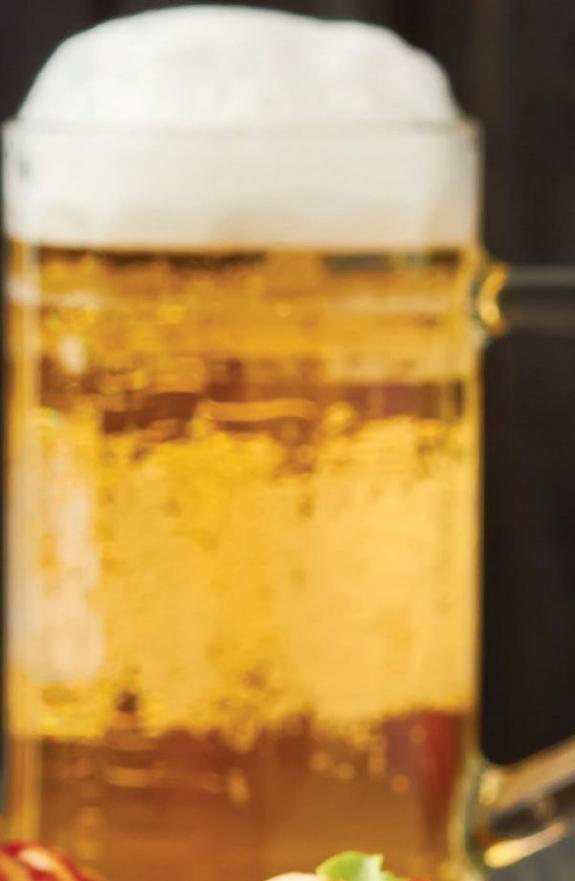
The AHA has noted 45 shop closures around the United States from January to August 2019. We currently have 656 US shops in our database, down from a peak of 815 in 2015. Among the stores that have closed, we frequently hear that shop owners just weren't seeing enough new →

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homebrewers coming through their doors to keep their businesses thriving. Many feel that they are losing business when their customers choose to shop online rather than visit their store.

Of course, every shop has its own story. Some shops are doing quite well. In surveys of shops, we've seen that newer brick-and-mortar shops are more likely to be growing than older stores.

If you have a local homebrew supply shop in your area, think about the value the store and its owners and employees provide to the local homebrewing community when choosing where to buy your supplies. And participate in Learn to Homebrew Day to get your local shop a few more customers.



2019 HOMEBREW CON SESSION RECORDINGS

Whether or not you attended Homebrew Con in Providence this past June, as a member of the American Homebrewers Association, you have access to the recordings of all of the educational sessions that took place during the conference. In fact, you have access to eight years' worth of Homebrew Con session recordings—that's 433 hour-long presentations on just about every subject you could possibly be interested in.

Don't let the mindboggling number of recordings intimidate you. It's easy to search for exactly what interests you, and sessions are broken down into 13 tracks such as Beer Styles, Do-It-Yourself, Going Pro, Historical, Recipe Formulation, and Sensory Analysis. You can also search among the most frequent speakers or by the year the presentation was given.

If you haven't taken advantage of this valuable resource, you are missing out on some serious brewing knowledge.



JUNE 18-20
NASHVILLE, TN

2020 HOMEBREW CON SPEAKER PROPOSALS

That covers 2012 to 2019—now on to 2020. We are now accepting session proposals to fill 50 to 60 openings for educational sessions at next year's Homebrew Con, which takes place June 18–20 in Nashville, Tenn. Do you have some knowledge you'd like to share with fellow homebrewers? If so, please submit a proposal by December 16. Sessions include approximately 45 minutes of presentation and 15 minutes of Q&A. Presenters get complimentary Full Conference passes to Homebrew Con. Go to HomebrewCon.org for more information and to submit your proposal.

Homebrew Con registration will be available in February 2020. Don't miss your chance to experience the most fun annual event in homebrewing taking place in one of the most fun cities in the USA!



AHA GOVERNING COMMITTEE CALL FOR NOMINATIONS

The AHA takes inspiration from 15 members, elected by the AHA membership, who volunteer their time and brainpower by

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by Lesaffre

serving on the AHA Governing Committee. Members of the Governing Committee serve three-year terms and participate in monthly conference calls and an annual in-person meeting at Homebrew Con. Committee members also serve on various subcommittees—there are eight in total—that cover specific areas of focus.

The AHA Governing Committee is currently accepting candidate nominations for the 2020 Governing Committee election. There are five open seats on the Governing Committee to be filled in the 2020 election, and voting takes place in February and March. AHA members interested in running for the Governing Committee can submit a nomination. For more information, see the [Governing Committee pages under the Community section of HomebrewersAssociation.org](#).

GOVERNMENT AFFAIRS

Most of the AHA's government affairs activities take place at the state level, where we address specific laws and regulations that directly affect homebrewers. However, the AHA also works to educate federal legislators in Washington, D.C., about the vibrant communities of homebrewers that exist in their districts.

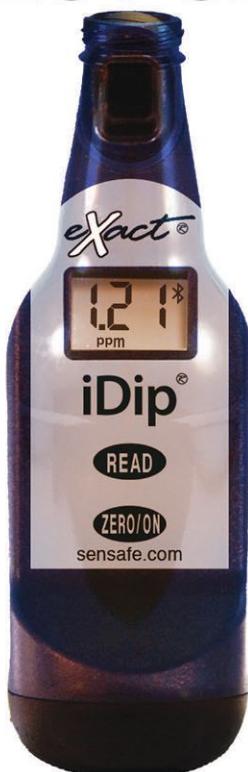


Rep. Peter DeFazio (D-OR 4th District) speaks at the 2018 Hill Staff Homebrew Competition awards ceremony. Also pictured: the best-of-show trophy.

In November, the AHA and our parent organization the Brewers Association (BA) will host a daylong homebrew event in [Washington](#), D.C., the second annual Homebrew on the Hill. At this event, local homebrew club members, professional brewers, and AHA staff join members of Congress and their staffs to learn about the process of homebrewing and homebrew law.

In December, the AHA and BA will host our annual [Capitol Hill Staff Homebrew Competition](#). The competition is open to any employee on Capitol Hill (custodial staff, security staff, congressional staffers, etc.). If you or anyone you know may be eligible to participate in the competition, please register by emailing AHA competition coordinator John Moorhead (john@brewersassociation.org).

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The AHA will also participate in the BA's Holiday Hill Tasting by serving Senate and House homebrews to legislators and their staff. Attendees will select a people's choice award, with one chamber earning bragging rights for the best beer.

These activities in our nation's capital help us ensure that homebrewing remains legal for the indefinite future and, if the need arises, homebrewers get fair treatment on any federal legislation that might affect us.



GIVE THE GIFT OF MEMBERSHIP

In case you weren't aware, the holidays are quickly approaching. There's no need to stress about gifts this year: we've got you covered for all your (adult) friends and family members. Who wouldn't love an AHA membership? Every year around the holidays, we celebrate with our annual Give the Gift offer that includes one of three free books from Brewers Publications with purchase of a new AHA membership. This year's offerings are *Brewing Eclectic IPA* by Dick Cantwell, *Gose* by Fal Allen, and *Session Beers* by Jennifer Talley.



The offer works with either direct purchase of a membership or purchase of a membership gift card. With more than 2,300 businesses offering AHA Member Deals, AHA membership is a great gift even if the recipient isn't an active homebrewer. Your gift will support the AHA and help us to continue to protect and promote homebrewing. See HomebrewersAssociation.org for more details.

We also have a year-round offer available at BrewersPublications.com. The Ultimate Brewer's Bundle includes a copy of John Palmer's *How To Brew* along with an AHA membership gift card. You can even gift yourself. We won't tell.

Until next time, happy brewing!

Gary Glass is director of the American Homebrewers Association.

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A professional portrait of Marcelo Cerdan, Director of Sales Americas, holding a glass of beer. To his left is a white smartphone displaying a large orange QR code with the text "SCAN ME" in the center. The background is dark.

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Math

QUIZ

The image shows a chalkboard covered with various mathematical sketches and equations. At the top left, there's a large 'QUIZ' in white chalk. To its right, a system of linear equations is shown with a solution matrix:

$$\begin{matrix} x & y & z \\ 1 & 2 & 1 \\ 2 & 1 & -1 \\ 1 & 0 & 1 \end{matrix} \xrightarrow{\text{Row operations}} \begin{matrix} x & y & z \\ 1 & 2 & 1 \\ 0 & -3 & 1 \\ 1 & 0 & 1 \end{matrix} \xrightarrow{\text{Row operations}} \begin{matrix} x & y & z \\ 1 & 2 & 1 \\ 0 & 1 & -1 \\ 1 & 0 & 1 \end{matrix}$$

Below this, a vector equation is given: $y_m = y_i + b, k_e$. To the right, a graph of a circle is shown with trigonometric labels: $\sin x$, $\cos x$, $\tan x$, and $\cot x$.

In the center, there's a diagram of a triangle labeled 'IIR' with sides labeled a , b , and c . The law of sines is written as $\frac{a}{\sin \alpha} = \frac{b}{\sin \beta} = \frac{c}{\sin \gamma}$. Below it, the Pythagorean theorem is shown as $a^2 + b^2 = c^2$.

To the right, a graph of a function $y = mx + c$ is shown, along with a point M and a line segment XY . A vector $x_1 = \begin{pmatrix} 2P \\ -P \\ 0 \end{pmatrix}$ is also drawn.

At the bottom left, a limit is calculated: $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{5x} = \frac{2}{5}$. Next to it, a matrix $A = [1, 0, 3]$ is listed. To the right, a graph of $y = \cot x$ is shown with vertical asymptotes at $x = 0, \pi, 2\pi$.

On the far right, a graph of $y = x^2$ is shown with points P_1 and P_2 marked on the curve. Below the graph, the equations $X_1 = -11P_1$ and $X_2 = -P_1$ are written. Further down, the equation $\frac{\sin x}{x}$ is shown.

Dear Zymurgy,

Petr Novotný's article "How Much Alcohol Is in Your Homebrew" (Jul/Aug 2019) was interesting—a lot of math but well derived. However, I do not understand the rationale of the factors 0.1808 and 0.8192 in Equation 2; all I see is that they add to 1. I found the same factors in Hubert Hanghofer's *Bier brauen nach eigenem Geschmack*, also without explanation. Where do these come from?

Cheers and best regards,
Carlo Voellmy
Rheinfelden, Switzerland

Article author Petr Novotný responds:

Hello Carlo, I am really glad that someone is taking the time to actually understand the math in the article.

Yes, the coefficients add to 1 because the initial (P_i) and final (P_f) extracts must be identical before fermentation, and the measured extract is also the "real" extract (Re): $Re = P_f = P_i$. But that does not explain their specific values. Those come from an empirical formula developed by Balling:

$$Re = \frac{q \times P_i + P_f}{1 + q}$$

where

$$q = 0.22 + 0.001 \times P_i$$

If you omit the P_i dependence of q, then q simply becomes 0.22, and after simplification you obtain approximately the coefficients as they appeared in the article. The values can vary a little bit based on the literature source used for q. That's the long answer. The short answer is that the coefficients are empirical and describe the fermentation balance as found by Balling.

LOVE FOR THE LAST ISSUE

Dear Zymurgy,

I've been a brewer for about five years and a Zymurgy subscriber since pretty much day one. I made my first Homebrew Con this year in Rhode Island.

This note is about recent issues of Zymurgy. I have greatly enjoyed the articles on beers from around the world and the historical articles. I think they're terrific. I'm writing this as much to thank you as to selfishly encourage you to please continue. The publication has been great in the years I've gotten it but seems to have taken another a step up recently. The content feels richer and deeper, and I find myself looking forward to it more than ever.

Thanks to you and your team. I work in a related field and know the effort that goes into sourcing content, organizing it, writing it, and laying it out. Your labor of love is greatly appreciated. You guys make brewing that much more fun!

Cheers,
Corey Guilbault
Norwalk, Conn.



Dear Zymurgy,
I'm not a homebrewer, but my son Tom is (he owns Rogue Valley Brewing Supply and Bottle Shop in Grants Pass, Ore.). I just received the newest Zymurgy magazine today (Sept/Oct 2019), and the picture of Shannon makes me smile! He radiates joy! *Mahalo nui loa* for your photo and to you, Shannon!

Tom Gilles

Dear Zymurgy,
Great stories: I especially enjoyed the Norwegian farmhouse ale article by Stan Heironimus ("A Day with Lars



on the Kveik Trail," Sept/Oct 2019). Very well written. Reminiscent of the Michael Jackson style and fun to read.

Nick Trausch
Mingo Junction, Ohio

BEST BEERS BUMMER

Dear Zymurgy,

Have you been slipping corn syrup into our beloved magazine?

First you cut down the number of favorite beers that you vote for from 20 down to 5. Heck, 20 was a tough limit to meet! Now, you've limited the results to 25! And cut out the top imports! Why? The clone recipes are cool, though.

Please bring back the numbers. And while you're at it, please bring back the four evaluations in Commercial Calibration because more data points are better there, too.

Thomas Wilk
Livonia, Mich.

Hi Thomas, the Best Beers poll continues to evolve: this year we had 25 clear standouts and chose to highlight those. Regarding imports, the beer landscape has changed dramatically since the survey began 17 years ago, and there's simply so much choice in American beer that AHA members are not voting for imports in significant numbers. It wasn't long ago that your choice of "domestic or import" was between industrial light lager and beer that might have spent more time on a container ship than it did in the brewery. How times have changed!



DOGS, CATS, AND, YOU KNOW, CHICKENS

Nala has performed several brew day chores and usually inspects all of the brew gear before we get started. Here she is monitoring the fermentation temperature and seeming to suggest it's time for a diacetyl rest!

Thanks,
Geoff Batchelder
Livermore, Calif.



Laya Eggana Solo
This is my brew chicken Laya (full name Laya Eggana Solo) inspecting the spent grains from the last brew. She and her two chicken friends always enjoy the addition of spent grains in their feed for a few days after brew day.

Michael Witschke
San Diego, Calif.



Teddy the brew dog
Teddy the brew dog is guarding the brew kettle while my son Doug and I are enjoying a homebrew. He usually naps while on duty, but today he is waiting for his treat.

John and Doug Lytle
Windsor, Colo.

My homebrew supervisor, Max, keeping an eye on me with his "time to add the hops" look.



Chris Kusmanick
Gloucester City, N.J.

Pancake, our Exotic Shorthair brew friend, loves to take a seat after a hard day brewing. In this case, the barrel got there first! If he fits, he sits.



Heather McCauley
Atco, N.J.



Here's Frankie, trusty brew dog and inventory inspector for Young Man Old Man Brewings (YMOM), enjoying a beautiful brew day!

Regards,
Jeff Poulson
Eagan, Minn.

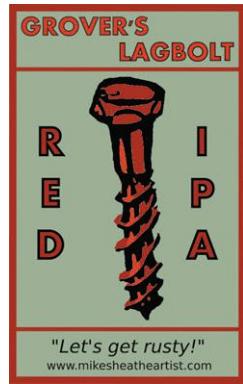


DEAR ZYMGURGY

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

HOMEBREW LABEL SUBMISSIONS

Grover's Lagbolt is a red IPA, and it is my favorite example of why feedback from a competition is so valuable. I entered it in its first competition as an American IPA and lost, but the judge said it was an outstanding red IPA, so switch categories. I did so and took home a second-place medal.



It's named after my brother-in-law, who is not named Grover; somebody mistakenly called him that. Coincidentally, I punctured my tire by running over a large screw on Grover Street. Thus, "Grover's Lagbolt."

I am an artist on the weekends, and I base most of my labels on my original artwork. The picture of the bolt itself is a print from a linoleum block print that I carved.

Mike Shea
North Shore Brewers
Homebrewer 7 years, AHA member 2 years
Beverly, MA



We are a big cider household, so making regular batches of the stuff was a no-brainer when I started brewing. My family says my shepherd Arya gets treated better than the rest of the family, and I thought it would be a cute play on the word "spoiled."

Joshua Smith - South Berwick, Maine



SUBMIT YOUR LABEL

Do you make custom labels for your homebrew? Want it featured here in the pages of Zymurgy for all to see your work?

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A large, dense green hop bush is shown in the foreground, with a mechanical harvester at its base. A significant amount of dust or debris is kicked up by the harvester. In the background, more rows of hop bushes extend into the distance under a clear blue sky. An oval-shaped graphic containing text is overlaid on the right side of the image.

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HIGH-ELEVATION KEGGING

Reading Martin Brungard's article about the differences in hop utilization at higher altitudes ("Advances in Wort Boiling," May/June 2019) got me thinking about other possible brewing outcome variations at higher altitudes. I was wondering if recommended kegging, bottling, or serving pressures change with altitude. If so, what is the correction factor?

Bill Tucker
Sierra Vista, Ariz.

Elevation and altitude do affect the serving pressure you need to apply to your kegs. The thing to remember about carbon dioxide (CO_2) regulators is that the indicated pressure on the gauge isn't based on absolute pressure but rather the pressure relative to ambient (atmospheric). As you climb in elevation, the density and pressure of the atmosphere decrease in tandem, which means the reference pressure for the regulator gauge drops accordingly.

Let's say you would normally set your regulator to 12 pounds per square inch (psi) at sea level for your favorite American pale ale. Atmospheric pressure at sea level is 14.7 psi, which means the absolute pressure applied to the keg is $14.7 + 12 = 26.7$ psi. That's how much absolute pressure is needed for that keg of pale ale to maintain the desired level of carbonation.

Now let's climb up 4,600 feet from sea level to Sierra Vista, Ariz., without adjusting the regulator. Atmospheric pressure there is going to be closer to 12.5 psi. If you didn't do anything to your regulator, the absolute pressure applied to the keg would only be $12.5 + 12 = 24.5$ psi. If you keep the keg at 38°F (3°C), that 2 psi difference would translate into a loss of about 0.2 to 0.3 volumes of CO_2 .

Let's keep going and climb to the summit of Humphrey's Peak, the highest point in Arizona, with an elevation of 12,633 ft. (3,851 m). (We don't generally recommend climbing mountains with a full keg but bear

with us.) Atmospheric pressure up there is a mere 9.2 psi, which would mean an unadjusted regulator would deliver only $9.2 + 12 = 21.2$ psi to the keg, a drop of 5.5 psi relative to the same setup at sea level. Now we're talking a carbonation loss of 0.5 volumes of CO_2 . Most tasters will be able to tell the difference.

The lesson to take away from this little thought experiment is that all other factors being equal, you need to increase the applied pressure to your keg of homebrew as you increase in elevation. A good rule of thumb is to add 0.5 psi for every 1,000 feet of gain, which is roughly 35 millibars for every 300 meters.

OK, great, but what about bottled beer? Unlike kegged beer, where you can adjust carbonation on a whim with the regulator and pressure relief valve, a bottle only holds a finite amount of carbon dioxide. The specific amount is determined when the cap is sealed at the brewery or in your kitchen. (Total CO_2 can increase if live yeasts or bacteria continue to

work after packaging, but for the sake of argument, let's assume that not to be the case.)

Now we have to invoke chemistry, specifically Henry's Law, which states that the amount of a gas dissolved in a liquid at equilibrium is proportional to the partial pressure of that gas above the liquid. Partial pressure is exactly what it sounds like, the fraction of the total pressure attributed to one of the constituent components of the gas. In the case of air, those fractions are roughly 78 percent nitrogen, 21 percent oxygen, and less than 1 percent other gases. One of those other gases, carbon dioxide, is barely there, with just 0.04 percent representation.

At sea level, where air pressure is 14.7 psi, carbon dioxide's 0.04 percent share translates into a mere 0.06 psi. That's why your drink goes flat when you leave it open: you're effectively venting all the dissolved carbon dioxide into a CO₂ vacuum.

If you package and drink a bottle of beer at the same elevation, you're in for no surprises. However, bottling at one elevation and then drinking it at another is another story. If you ascend to a high elevation, opening a bottle packaged at sea level leads to more foam, more visually aggressive bubbles, and a sharper sense of carbonation as the dissolved CO₂ attempts to equilibrate with the comparatively lower pressure of atmospheric CO₂.

On the other hand, packaging at high elevation and then opening the bottle at a lower elevation will yield less of a head, less visually arresting bubbles, and a sense that the beer is flatter than it should be.

For a detailed treatment of these kinds of issues, including carbonation charts and troubleshooting tips, check out the Brewers Association's

Draught Beer Quality Manual, available as a free download at draughtquality.org.

DILUTION VIA STARTER

I recently brewed an IPA with an original gravity of approximately 1.070 as measured with a refractometer. I have a TILT (wireless hydrometer and temperature gauge) as well, and it reported 1.073 from the fermenter before yeast was added. An original gravity of 1.073 compared to 1.070 is close enough, and I only use the TILT to measure temperature and determine when fermentation is complete.

I had a TILT reading from just wort in the fermenter and then compared it after I pitched my 2-liter yeast starter. The reading dropped immediately down to 1.064. Is this expected, does the yeast starter "dilute" the wort? And is it a concern? In the end, 2 liters is more than 0.5 gallons. This seems to be a bigger problem for higher-gravity beers (the ones that require larger starters) as the OG of the wort is very different from the OG of the starter.

Thanks,
Michael Witschke
San Diego, Calif.

Adding 2 liters of starter to 5 gallons of wort increases the total volume by more than 10



percent, and the specific gravity (SG) of the mix will be a volume-weighted average of the SGs of the starter and the wort you collect on brew day. If the starter's SG were identical to the wort's original gravity (OG), there would be no change in overall gravity. But most of us don't make 1.070 starters! Even if we did, we add starter when its SG has attenuated well below its OG. Either way, the net OG changes.

A typical yeast starter is around 1.035 OG. If you run the math, 2 liters of unfermented 1.035 wort added to 5 gallons of 1.070 wort will yield just over 5.5 gallons of 1.067 wort. If that starter wort has fermented down to 1.012, you get 5.5 gallons at 1.064.

A hydrometer floats at the top of the fermenter. And what else floats (aside from ducks and witches)? Less dense liquids. That's why Irish stout sits atop English pale ale in a black and tan. It's possible that when you poured the starter into the wort, it only partially mixed, leaving some 1.070 wort at the bottom of the fermenter and a bit of starter near the top where your hydrometer was sitting. Eventually, after everything had a chance to mix, we suspect the gravity of the whole thing settled somewhere between 1.064 and 1.067.

Does it matter? Probably not. But if you're concerned, you can account for these variables in your brewing calculations to yield a desired gravity and volume after you add the starter. Let's use OG and V to denote original gravity and volume, respectively, and let's use the subscripts s, w, and b to refer to the starter, main wort, and overall batch, respectively. The total mass (density times volume) of the batch is the sum of the masses of the starter and the wort:

$$OG_s V_s + OG_w V_w = OG_b V_b$$

And the sum of the volumes of the starter and wort is the total volume of the batch:

$$V_s + V_w = V_b$$

If you prepare a starter of known gravity, you can calculate the specific gravity you need to target on brew day to yield a final batch with the original gravity you have in mind:

$$OG_w = \frac{OG_b V_b - OG_s V_s}{V_b - V_s}$$

After calculating that gravity, then you can determine how much wort you need to collect on brew day before adding the starter:

$$V_w = \frac{OG_b V_b - OG_s V_s}{OG_w}$$

Again, it probably won't make a big difference in the finished beer, but if you want to get more precise, that's how you do it.

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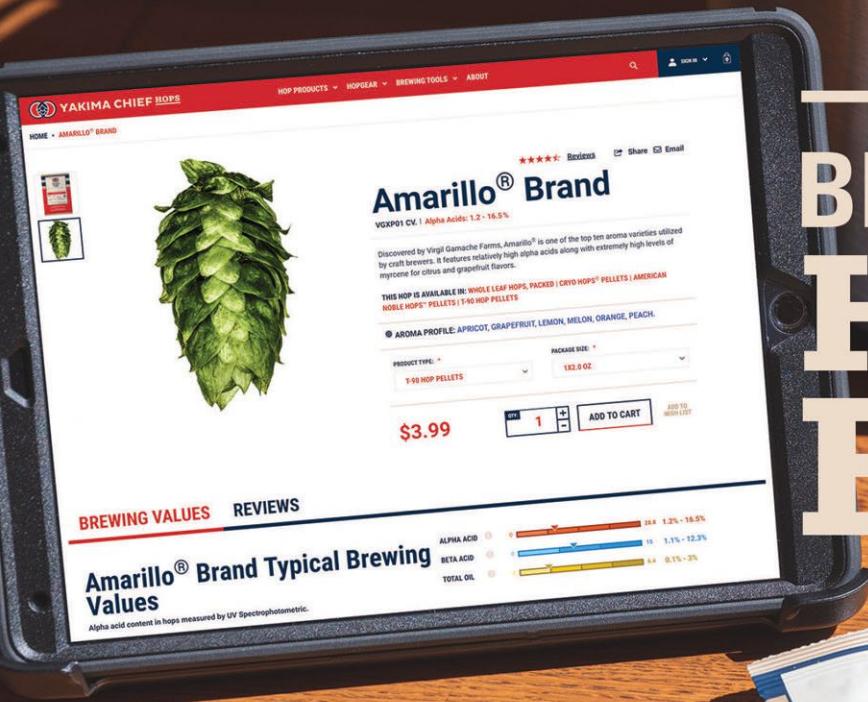
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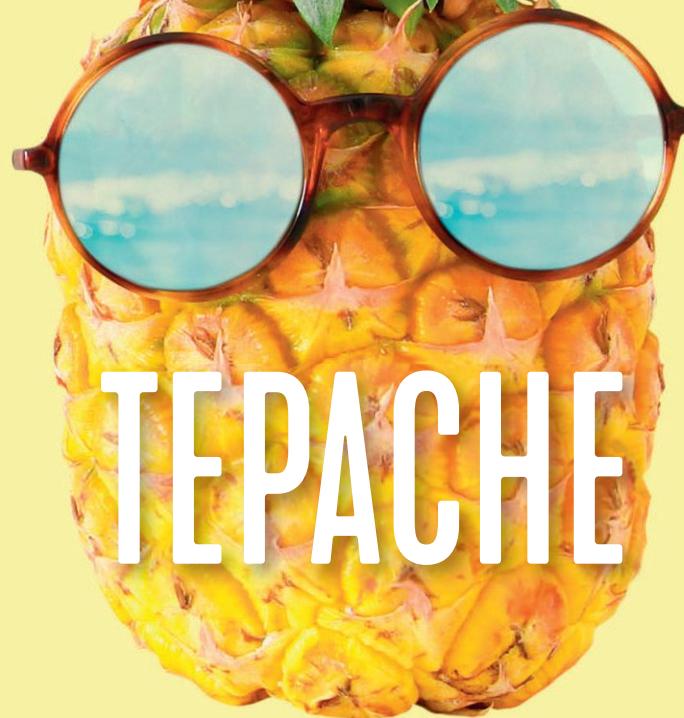
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TEPACHE

This *agua fresca* originated in pre-Columbian Mexico and is generally attributed to the Nahua people, who first made it with corn. Tepache literally means “drink made from corn” in the *náhuatl* language, but these days it’s a lightly alcoholic beverage often served by street vendors in Mexico, usually made from pineapple rinds, sugar, water, spices, and yeast.

The base recipe for tepache is very simple, but of course variations on the theme are endless; as homebrewers, we have the skills and equipment to manipulate fermentation as we please, so it’s a great drink to experiment and have fun with, especially if you’re into tropical fruit flavors.





FRUIT

Some recipes call for one whole pineapple, but most allow you to just use the thick peel and the core of two fruits for tepache, along with sugar, spices, and the natural yeast that collects on the peel's bumpy surface. The flesh of the pineapples can be reserved for eating, cooking, or perhaps garnishing your glass of tepache.

When choosing a pineapple, some things to consider are weight, size, color, and aroma. The fruit should feel heavy for its size, with more orange and yellow coloring than green. If you smell the base (which is where most of the sugar-rich juices reside), it should have a fruity, aromatic sweetness. If your only choice is a green pineapple, you'll have to let it sit on the kitchen counter for several days until it ripens. You'll know it's getting close by the aroma it puts out; another indication is that the serrated "leaves" of the crown detach easily when tugged. Bigger pineapples are usually better, as they are often sold per fruit rather than per pound. And then there's the organic question.

Although pineapples are always showing up on "clean" fruit and vegetable lists, meaning pesticide and herbicide residues are below the threshold of safe consumption, these lists assume you will be removing and discarding the rind. But according to one eye-opening article¹, US multinationals Dole and Del Monte dominate global pineapple production and are two of the heaviest users of herbicides and pesticides. Organophosphates, organochlorines, hormone disruptors, fungicides, known carcinogens—even after a good washing, those cheap supermarket pineapples aren't going to do your health or your tepache any favors, so bottom line: spring for organic if you can.

When ripe, wash the fruit and simply lop off the crown and the base. Pineapples are bromeliads, so if you live in a tropical state like Florida or Hawaii, you can simply plant the crown, keep it well watered in well-drained soil, and with full sunlight you'll have a pretty good chance of its rooting and growing into another pineapple plant. Or you can just compost it along

with the center of the base, which can often develop mold, so you don't want that in your tepache. The rest of the rind around the sides of the fruit, though, can be cut into strips and used, along with the woody core of the fruit.

You can also mix things up with additions of other fruit. Guava, citrus, tamarind pods, cantaloupe, watermelon, mango, and even strawberries all make great variations. Strawberry kumquat tepache, anyone?

SUGAR

Any old sugar will do for tepache, but for added depth of flavor, you might want to consider a traditional raw brown sugar like *piñoncillo*, which is shaped like a cone and can be purchased from Mexican grocery markets. Suitable substitutes are *rapadura* and *panela*, but turbinado or brown sugar will work if these aren't readily available in your area. Some recipes also call for palm sugar. No need to dissolve the sugar; just add it in with your fruit and water, and it will dissolve on its own as fermentation begins.

One of my favorite sugar variations is agave syrup. This slightly viscous amber liquid adds a tequila-like dimension to tepache that is beautifully compatible with the fruit flavors; in fact, chilled, carbonated tepache is often mixed with either lager or used as an accompaniment to tequila or mezcal. Fermented agave nectar is technically called *pulque*, but that's another beverage for another day.

SPICES

Whole cloves and cinnamon sticks are traditional. I like using allspice berries, which I find less one-dimensional than cloves, but you can find recipes with grains of paradise, coriander, cubeb berries, cardamom, and long peppercorns. Spices present another opportunity to experiment with various flavor combinations. To add a bit of heat, you can also dice up a fresh jalapeño, serrano, or (for the extra brave) habanero pepper.

YEAST

Traditionally, only the yeasts and bacteria on the pineapple rinds are used

to ferment tepache. You do wash these rinds to remove dust and other debris, but enough microbes should remain to initiate fermentation. Just note that bacteria on the fruit include *Acetobacter*, and tepache that is allowed to ferment too long often ends up more like pineapple vinegar than *agua fresca*.

So, to produce a more beer-like product, I will often steal a sample off a fermenting batch of beer and add it to my tepache to kickstart fermentation and ensure there is more yeast at work than bacteria. You can also use a pinch of dry ale yeast. This also increases the alcohol content slightly and increases shelf stability, though tepache really isn't meant to be aged for any length of time—thus, the *fresca*.

PROCEDURE

Cover the fruit with filtered brewing-quality water in a large, sanitized fermentation vessel; yield is generally about 1 gallon (3.8 liters) for every two pineapples' worth of rind and core. Then add a cup (200 g) of packed raw cane sugar, one whole cinnamon stick, five whole allspice berries, and yeast or fermenting beer if you are using it. Then cover with cheesecloth or plastic wrap and keep at room temperature until signs of fermentation are evident.

A white foam will begin to rise to the surface of the tepache after a day or so, depending on the ambient temperature. Skim it off and continue to ferment another 24 to 48 hours. Then it's time to smell and taste your *agua fresca*. It should be slightly cloudy and bready from the yeast, and it should have a spicy pineapple fragrance. If your nose catches something moldy or meaty, you probably have a contaminated batch: best to toss it.

If everything smells good, though, taste a sample. There should be some residual sugars left, with a developing acidity and some fizz. If it's too sweet, give it another 12 hours and taste it again, and/or squeeze in some fresh lime juice. If it's too dry, add a bit more brown sugar. When the balance is to your liking, you can either refrigerate it, strain out the solids and serve chilled over ice as-is, or

Brew
This!



Tepache

Batch Volume: 1 gallon [3.8 L]

Alcohol: 2–3% by volume,
before dilution

FERMENTABLES

1 cup (200 g) piloncillo or other raw brown sugar, or to taste

2 ripe organic pineapple skins and cores, chopped

To taste Other fruit, chopped and added to fermenter (optional)

OTHER INGREDIENTS

1 cinnamon stick
5 whole cloves or allspice berries
1 pinch dry ale yeast, or 100 mL fermenting beer (optional)

WATER

4 qt. (3.8 L) filtered water

BREWING NOTES

Wash well-ripened pineapple thoroughly. Chop off crown and base and discard. Remove skin and core from flesh and save flesh for another use. Chop skin and core into pieces and add to fermenter with sugar, spices, water, other fruit (if using), and yeast (if using). Try to keep solids submerged below surface of water. Cover and keep at 70–75°F (21–24°C) until signs of fermentation are evident. Skim any white foam that rises to the surface. Ferment an additional 24–48 hours, then smell and taste the batch, adjusting sugar and acidity level if necessary. When done, chill and enjoy or package and carbonate (see text).

you can bottle it in screw-capped PET bottles and allow those to carbonate at room temperature. Give them a squeeze every 2 to 4 hours. When carbonation is evident, chill the bottles to serving temperature and enjoy. Some people dilute tepache further at this point, or you can serve it with a stronger beverage like beer or tequila.

That's it. If you like how your batch came out, you can cheat and add water and another cup of brown sugar to your original fermenter and make a second batch, perhaps adding some fresh, sliced-up fruit. This second batch will fer-

ment much faster, so keep an eye on it. Tepache is a natural probiotic and a great source of B and C vitamins. Unless beer is added (fermenting as a yeast starter or finished as an accompaniment), tepache is also gluten-free.

RESOURCES

1. Lawrence, Felicity. "Bitter Fruit: The Truth About Supermarket Pineapple." *The Guardian*, US Edition, Friday, Oct 2010. 19.04 EDT.

Amahl Turczyn is associate editor of Zymurgy.



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BREWING WITH *Honey*

By Keith Seiz

Thousands of years ago, honey was a common source of fermentable sugars for the production of alcohol. Today, brewers have expanded the ingredient's use beyond fermentation to add flavor and aromatic complexity to food and beverages. We're even seeing brewers using it in barrel-aging programs and for bottle conditioning.

Honey's popularity in brewing mirrors its increased usage throughout the food and beverage industry, but for different reasons. Chefs and large-scale food and beverage makers appreciate that it's a 100 percent natural sweetener made in a beehive, not processed in a manufacturing facility.

But honey's real value in brewing derives from its functionality and flavor. Honey gives brewers a unique and often hyper-local story to tell about their beer, a story of terroir, floral source, and even the importance of honey bees to our entire food system. →



For professional brewers, using honey has never been more popular, as evidenced by the popularity of the National Honey Board's Honey Beer Competition. The 2019 competition featured 290 entries compared to 169 the previous year. The two most interesting aspects of this year's entries were the diversity of beer styles represented, from IPAs to sours, and the point in the brewing process at which the star ingredient was added, whether at flameout, high kräusen, or in barrels to spur secondary fermentations.

The timing of this addition plays an important role for flavor and aromatics in finished beer, but it's also important to understand the chemical composition of honey and how its various carbohydrates, acids, enzymes, and other compounds can affect the brewing process.

ONE INGREDIENT, 181 COMPONENTS

Bees, specifically the European honey bee (*Apis mellifera*), gather nectar and process it into a versatile food with some unique properties. Honey is made when bees gather nectar and other plant products and then modify, concentrate, and store them in the comb. Kept in its pure, undiluted form in hexagonal wax chambers by the bees, it can last almost indefinitely.

Over 180 different components have been identified in honey, including multiple carbohydrate and acid types, water, minerals, bacteria, and yeast. Bees gather nectar and other essences from thousands of different flowering trees, shrubs, herbs, and other plants, resulting in a nearly infinite combination of ingredients. Along with what the bees themselves contribute as they process plant components into honey, the resulting product can add complexity to mead, beer, and other foods.

About 82 percent of honey is made up of carbohydrates, with water accounting for roughly 17 percent, although climate can affect this (those living in dry climates might find their honey has less moisture). Fructose and glucose are the two main carbohydrates, at levels of about 46 percent and 38 percent, respectively.

More complex sugars are also present, such as sucrose, maltose, and maltotriose, but 90 to 98 percent of those sugars are fermentable. Carbohydrates give honey its trademark sweetness, but aliphatic and aromatic acids determine aroma and tartness. This combination of carbohydrates and acids forms a unique flavor profile that, if added at the correct time in the brewing process, can come through in the finished beer.



Klosterman Honey Wheat Lager

Best of Show: Bronze, 2019 Honey Beer Competition

Recipe courtesy Fretboard Brewing Co., Cincinnati, Ohio

Jim Klosterman is "Lead Guitar" at Fretboard Brewing Co. His last name is attached to this beer thanks to Fretboard's collaboration with Klosterman Baking Co., a Cincinnati bakery that supplies bread and buns across the United States. Fretboard collaborates on two styles with Klosterman, a Rye Lager with caraway seed and the Honey Wheat Lager below.

Batch volume: 5.75 US gal. (21.8 L)

Original gravity: 1.050 (12.4°P)

Final gravity: 1.009 (2.3°P)

Efficiency: 75%

Color: 7 SRM

Bitterness: 10 IBU

Alcohol: 5.2% by volume

MALTS

5.5 lb. (2.49 kg) Pilsner malt

1.75 lb. (794 g) white wheat malt

1.25 lb. (567 g) honey malt

HOPS

0.25 oz. (7 g) Nugget, 13% a.a. @ 60 min

0.75 oz. (21 g) Hallertauer Mittelfrüh, 4.5% a.a.

@ 5 min

ADDITIONAL INGREDIENTS

2 lb. (907 g) clover honey, steeped after boil

YEAST

White Labs WLP830 German Lager

BREWING NOTES

Mash grains for 35 minutes at 151°F (66.1°C), or until starch conversion is complete. Sparge at 170°F (76.7°C). Collect 7.5 gal. (28.4 L) of wort in the kettle and boil for 90 minutes, adding honey after knockout. Ferment at 55°F (12.8°C).

EXTRACT VERSION

Replace grains with 4.5 lb. (2.04 kg) Pilsner liquid malt extract and 2 lb. (907 g) wheat liquid malt extract. Dissolve the extracts in warm reverse osmosis water, top up to desired volume, and proceed with the boil as above.



Keith Seiz, National Honey Board.



Although most brewers use honey either at the end of boil or right after peak fermentation, a growing number of brewers use it in bottle conditioning and to spur a secondary fermentation in a barrel or foeder.

The remaining fraction includes other compounds: enzymes, polyphenols, vitamins, minerals, antioxidants, bacteria, and yeasts. However, because these are present at such low levels, they don't usually play a role in brewing. That said, if you do nothing more than dilute honey, these naturally occurring yeasts and bacteria will begin to ferment it. Such no-heat, no-pitch mead can be delicious, but it may not have the stability of single-strain-pitched, pasteurized-honey mead.

There is always the remote possibility that the native microorganisms in raw, unpasteurized honey can have an adverse effect. Normally, honey's acidity keeps them dormant, but when diluted by wort, beer, or water, they can become active.

Brewers concerned about this have two options. First, they can add the honey at the very end of the boil. The wort's heat will denature any enzymes and microorganisms while still retaining most flavors and aromatics. They can also heat it directly. Research by the National Honey Board concluded that diluting honey with water on a 1:1 basis and heating it for 20 minutes at 185°F (85°C) was effective and preserved the most honey character.

HONEY AND FERMENTATION

Because of its high fermentability, honey will function like any other sugar when used as part of a beer recipe. You can expect a boost in alcohol and a lighter,

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Chomolungma

Best of Show: Gold, 2019 Honey Beer Competition



Recipe courtesy Jackie O's Pub & Brewery, Athens, Ohio

In May 2007, Art Oestrike's brother Brian Oestrike summited Mount Everest to raise money for the LUNGevity Foundation, a lung cancer-focused nonprofit. Art and Brian's mother, Jackie, had passed away from lung cancer on June 14, 2006. As Newcastle Brown Ale was a favorite of Jackie's [who was born in England], then-brewer Brad Clark created the recipe for Chomolungma as an American interpretation of the British classic. The beer was named for the word Tibetans use for Mount Everest, which means "Goddess Mother of the Earth." When it came time to choose the core lineup of beers to be released in cans from our production brewery in 2012–2013, this meant-to-be-one-off beer had become the third-best seller at our brewpub. It was first packaged in cans in May 2013 and has been a favorite of customers and staff alike ever since.

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.060 (14.7°P)

Final gravity: 1.013 (3.3°P)

Color: 25 SRM

Bitterness: 25 IBU

Alcohol: 6.5% by volume

MALTS

4.6 lb. (2.09 kg) Briess Brewer's Malt
1.4 lb. (635 g) Briess Munich Malt
0.75 lb. (340 g) Briess Caramel 60 Malt
0.5 lb. (227 g) Briess White Wheat Malt

0.4 lb. (181 g) Dingeman's Chocolate Malt
0.4 lb. (181 g) Dingeman's Aromatic Malt
0.4 lb. (181 g) Briess Special Roast Malt

HOPS

0.2 oz. (6 g) Northern Brewer,
8.5% a.a. @ 75 min
0.2 oz. (6 g) Northern Brewer,
8.5% a.a. @ 60 min

0.2 oz. (6 g) Northern Brewer,
8.5% a.a. @ 45 min
0.7 oz. (20 g) Willamette,
5.5% a.a. @ 15 min

ADDITIONAL INGREDIENTS

2.5 lb. (1.13 kg) local, minimally processed honey @ 30 min

WATER

Ca 48 ppm, Mg 12 ppm, SO₄ 30 ppm, Na 80 ppm, Cl 46 ppm

YEAST

Your preferred English ale strain

BREWING NOTES

Mash at 152°F (66.7°C) for 30 minutes, aiming for a mash pH of 5.2. Sparge at 165°F (73.9°C) and then boil for 75 minutes. The wort pH should be 5.0 at knockout. Ferment at 65°F (18.3°C).

EXTRACT VERSION

Replace Briess Brewer's Malt, Briess Munich Malt, and Briess White Wheat Malt with 3.5 lb. (1.59 kg) pale liquid malt extract and 1 lb. (454 g) Munich liquid malt extract. Steep the remaining malts in 160°F (71.1°C) reverse osmosis water for 30 minutes. Remove grains, dissolve the extracts in the resulting wort, top up to desired volume, and proceed with the boil as above.

crisper beer. What you shouldn't expect is a sweet beer, unless it is used after peak fermentation, or used in quantities that overwhelm your yeast's ability to ferment it. With most yeast strains, honey used on the hot side at a rate of less than 12 percent of original extract (e.g. less than 6

gravity points in 1.050 wort) will ferment out almost completely, leaving no residual sweetness, but instead a complex flavor that is often described as grassy or earthy.

Used at rates higher than 12 percent, honey does have the potential to delay fermentation times and may contribute

Brew
This!



Valhalla

Recipe courtesy Greg Foley, Crestone Brewing Co., Crestone, Colo.

This mead-beer hybrid is the strongest beverage produced at Crestone Brewing Co. Dosed with local honey throughout the brewing and fermenting process, it's got great floral honey character, a dry finish, and a delicious, boozy character. Deceptively drinkable—be careful.

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.112 (26.4°P)

Final gravity: 1.003 (0.8°P)

Color: 7 SRM

Bitterness: 35 IBU

Alcohol: 15% by volume

MALTS

8 lb. (3.63 kg) Pilsner malt
1.25 lb. (567 g) Weyermann Munich II malt
8 oz. (227 g) Weyermann Carahell malt
6 oz. (170 g) aromatic malt

HOPS

0.75 oz. (21 g) Magnum, 12% a.a. @ 60 min



residual sweetness. Compared to traditional European lager or British pale ale worts, with a greater proportion of maltose and other complex sugars, worts containing honey have significantly more simple sugars. Yeasts will consume these simple sugars first, and if enough are present, some strains can exhaust themselves, slowing or halting fermentation.

Without sweetness added to the final flavor profile, why would a brewer be interested in using honey on the hot side? One reason is that it has the ability to bump up the ABV of a beer without increasing sweetness. The National Honey Board has tracked an increasing number of brewers using it to convert IPAs into DIPAs. It is often smoother than other sugars and has the ability to mellow the bitter edges of hops, allowing more fruity and floral characteristics to come through.

ADDITIONAL INGREDIENTS

7.5 lb. (3.40 kg) honey, split into three
2.5-lb. (1.13-kg) additions

YEAST

Fermentis SafAle S-04 or Wyeast 3787
Trappist High Gravity

BREWING NOTES

Mash grains at 149°F (65°C) for one hour. Lauter, sparge, collect wort, and boil 90 minutes, adding the single hop addition an hour before knockout. Cool wort to 180°F (82.2°C), add the first honey addition, and whirlpool 10 minutes.

After whirlpool, cool wort to 65°F (18.3°C). The specific gravity at this point should be around 1.070 (17.1°P). Add a large pitch of healthy yeast (use multiple packs, multiple starters, or the slurry from another lower-gravity batch) and oxygenate thoroughly.

On day 5 of fermentation, or when it shows signs of slowing, add the second addition of honey. Add the third addition on day 6 or 7, or when fermentation once again shows signs of slowing.

When specific gravity reaches approximately 1.002–1.003, keg or bottle.

EXTRACT VERSION

Replace grains with 7 lb. (3.18 kg) Pilsner liquid malt extract and 1 lb. (454 g) Munich liquid malt extract. Dissolve the extracts in warm reverse osmosis water, top up to desired volume, and proceed with the boil as above.

Hot-side use prior to fermentation provides complexity. On the cold side, honey imparts more flavor and aromatics. The National Honey Board recommends adding it just after peak fermentation to allow some of the sugars to be digested while still promoting flavor.

Undiluted honey on the bottom of the fermentation vessel will eventually disperse and be consumed by yeast. This may be a useful tactic for high-gravity homebrewers or meadmakers who want to avoid shocking yeast with the high osmotic pressure that can result from dissolving honey all at once, but it does delay fermentation time. In lower amounts where this is not a concern, ensure complete incorporation in wort by gently warming honey in a hot-water bath or blending it with equal parts water before incorporation.



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COMMON HONEY VARIETALS

ALFALFA HONEY

Alfalfa is a legume with blue flowers. It blooms throughout the summer and is ranked as the most important honey plant in Utah, Nevada, Idaho, Oregon, and most of the western states. Alfalfa honey is white or extra-light amber in color with hints of dried grass and subtle baking spice notes.

Suggested Use: This versatile honey can be used on the hot and cold sides to impart complex, grassy undertones.

BUCKWHEAT HONEY

Buckwheat is usually planted in the spring and grows best in cool, moist climates. The buckwheat plant prefers light, well-drained soils, although it can thrive in highly acidic, low-fertility soils as well. It blooms quite early and it yields a dark brown honey with a robust flavor profile that has barnyard, earth, tobacco, and dark cherry notes.

Suggested Use: This strong-flavored honey is perfect for hot-side additions to impart a complex flavor profile to the finished beer.

ORANGE BLOSSOM

Orange blossom honey is often a combination of citrus floral sources. Orange is a leading honey source in southern Florida, Texas, Arizona, and California. Orange trees bloom in March and April and produce an amber honey with a distinctive flavor and the aroma of citrus.

Suggested Use: This all-around honey provides complexity to beer whether used on the hot or cold side. On the hot side, add at the end of boil to preserve orange blossom's citrus notes.

TUPELO

Tupelo honey is produced in the southeastern United States. Tupelo trees have clusters of greenish flowers that later develop into soft, berry-like fruits. In southern Georgia and northwestern Florida, tupelo is a leading honey plant that produces tons of white or extra-light amber honey in April and May. The honey has a delicate, floral flavor and a strong aroma.

Suggested Use: The delicate flavors of this honey are best used on the cold side, after peak fermentation or as a barrel addition.



Stone Ship
Braggot

Best of Show: Silver, 2019 Honey Beer Competition

Recipe courtesy Four Fathers Brewing Co., Valparaiso, Ind.

This beer-mead hybrid combines the wort from a fairly typical brew session with a honey must that has been caramelized using hot rocks. For more information on working with hot rocks, including safety guidelines, see "Fahrenheit 951" in the Jul/Aug 2019 issue of Zymurgy.

Batch size: 5 US gal. (18.9 L)

Original gravity: 1.109 (25.7°P)

Final gravity: 1.024 (6.1°P)

Color: 35 SRM

Bitterness: 22 IBU

Alcohol: 11% by volume

BREWING NOTES

Mash grains for 60 minutes 156°F (69°C), mash out at 168°F (76°C), vorlauf, and run off to kettle. Lauter, sparge, and collect approximately 4.5 gal. (17 L) of wort. Boil 90 minutes. Add lactose and buckwheat honey at flameout.

MALTS

4 lb.	[1.81 kg] 2-row malt
4 lb.	[1.81 kg] dark Munich malt
1 lb.	[454 g] honey malt
12 oz.	[340 g] rye malt
8 oz.	[227 g] chocolate malt
8 oz.	[227 g] smoked malt
6 oz.	[170 g] Baird Light Carastan Malt
6 oz.	[170 g] flaked oats
4 oz.	[113 g] Briess Blackprinz Malt
3 oz.	[85 g] acidulated malt

HOPS

0.5 oz. [14 g] CTZ, 12.4% a.a. @ 60 min

ADDITIONAL ITEMS

rice hulls as needed for lautering
8 oz. [227 g] lactose
1.25 lb. [567 g] buckwheat honey @ knockout
4.5 lb. [2.04 kg] wildflower honey
basalt rocks as needed to scorch wildflower honey
6 oz. [170 g] black walnut pieces, secondary
6 vanilla beans, split, secondary

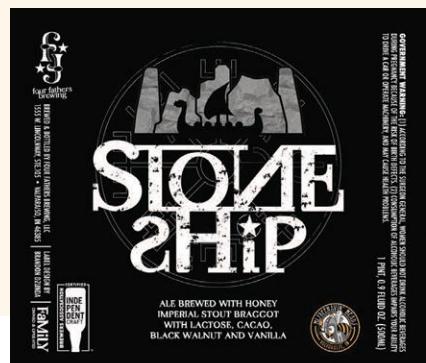
YEAST

Omega Yeast Labs OYL-004 West Coast Ale

In a separate vessel, scorch wildflower honey with super-heated basalt rocks (heat basalt rocks on an open flame and then drop into honey to allow scorching and caramelization). Add enough clean hot water to honey to bring the mixture up to about 1.7 gal. (6.4 L).

Cool the wort and scorched honey must to 64°F (17°C) and blend for fermentation. Pitch yeast and ferment at 64°F (17°C).

After fermentation, rack to secondary and add black walnut pieces and vanilla beans. Age for several weeks or until flavors develop to your liking, and then bottle or keg.



As with hot-side additions, using honey on the cold side increases the degree of fermentation, yields more alcohol by volume, and lends a drier, lighter body to the finished beer. The advantage of cold-side additions is that more flavor and aromatics will be preserved in the final product.

Although most brewers use honey either at the end of boil or right after peak fermentation, a growing number use it in

bottle conditioning and to spur a secondary fermentation in a barrel or foeder.

Brewers should explore bottle conditioning with honey when they want the priming sugar to play a role. If all you want is carbonation, plain dextrose will suffice, but honey, particularly monofloral varieties, can provide strong aromatic acids and complex flavor when used as a priming agent.

Monofloral varietals, such as orange blossom, buckwheat, and watermelon, give brewers the ability to impart specific flavor profiles to their beers.

MORE THAN 300 HONEY VARIETALS

Monofloral varietals, such as orange blossom, buckwheat, and watermelon, give brewers the ability to impart specific flavor profiles to their beers. These result when bees predominantly visit one type of plant, and the nectar they pull from the flowers imparts a recognizable color, flavor, and aroma to the honey.

In the United States, there are more than 300 honey varietals, and worldwide, there are more than 3,000. In general, the darker the color of honey, the more robust the flavor profile, whereas lighter-colored honeys usually have more delicate and nuanced flavors.

When choosing a honey for brewing, the National Honey Board recommends one with a stronger flavor if used on the hot side. Those stronger flavors will better survive fermentation and provide depth of flavor. More delicate honeys can be used on the cold side or in bottle conditioning to add subtle aromas and nuanced flavors.

Honey's versatility gives brewers ample room for experimentation, whether they want to add a hint of sweetness or complexity to almost any style of beer.

Keith Seiz has spent the last nine years traveling the country talking to brewers, distillers, bakers, and food manufacturers about honey. In his role with the National Honey Board, he oversees all beer efforts, including research, events, and competition.



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PAST THE FINISH LINE PROPERLY SERVING DRAUGHT BEER

By Andrew Luberto

A few months ago, my wife and I decided to check out a new brewery's tasting room near our home on Long Island. It was a nice place. You could tell the owners had spent a lot of time getting it up and running and had taken great care with the decor. However, when we sat at the bar and ordered, I noticed the server fully immersing the faucet into each beer she poured and reusing patrons' glasses without cleaning them. We haven't been back since.

I wish I could say this was an isolated incident, but unfortunately it's not. As the former president of a homebrew club, the Long Island Beer and Malt Enthusiasts, this incident got me thinking how conversations with my craft beer-oriented friends have evolved over time. Today, I find myself more frequently discussing draught systems and proper beer storage than mash temperatures and hop stands.

Many have begun to realize that all the time and effort spent perfecting your favorite homebrew recipe can be compromised in just the few seconds it takes to pour a beer. And while brewing references and resources are well known, there seems to be more unfamiliarity when it comes to finding answers about beer service. With that in mind, I've collected a few tips and resources on properly serving beer from some of my more frequent discussions. →



POURING DRAUGHT BEER

This is the most common mistake I see. Thankfully, it is also the easiest to correct, and it costs nothing. Hold the glass an inch or two under the faucet at a 45-degree angle. Quickly and fully open the faucet. Pour at a 45-degree angle until the glass is about half full, and then slowly straighten the glass and pour down the middle to create a one-inch collar of foam. Quickly and fully close the tap. Done.

Simple right? If you need a visual, please go to draughtquality.org, CraftBeer.com, or micromatic.com to see how it's done. Or just do a quick Google search—it's very easy to find and meant to be so.

There is one point I'd like to stress: at no time should the faucet be submerged into the beer or touch the glass. There are a few reasons for this.

First, it affects the flavor of the beer. Submerging a faucet coats it with beer. Chances are it isn't getting cleaned afterwards, which makes that faucet a breeding ground for microorganisms. This means a dirty faucet covered in old, contaminated beer gets dunked into every subsequent pour of otherwise fresh beer—not very appealing.

Second, it's dangerous. Glass is fragile and may chip when in contact with a metal tap. No one wants to drink from a chipped glass.

Last, and most importantly, it's unsanitary. This is especially true if you don't use a clean glass for every pour. Submerging a faucet in a used glass is akin to placing everyone's mouth on it. Imagine if a restaurant took a single spoon and went around to every table, stirred each drink, and then took that spoon and dropped it into your glass. Or, imagine ordering a bottle of beer and watching your server submerge the neck of the bottle in your glass as they pour it. These scenarios probably wouldn't go over too well, so leave the faucets out of this (pun intended).

DIRTY GLASSES, FRESH GLASSES

Ever pour a beer and see bubbles clinging to the side of the glass? This indicates that there is dirt or residue on the inside of the glass. Carbon dioxide is present in almost all beer and, since it is less dense than beer, it rises to the surface. Rising CO₂ is one reason beer has foam. However, if there is dirt or film on the side of the glass, carbon



dioxide bubbles will cling to those areas. So, if you get a glass that has bubbles clinging to the side, it means the glass wasn't cleaned properly. Go grab another one.

While we are on the topic of clean glasses, let's talk about glass rinsers. Using a glass rinser to wash out used glasses between pours is unsanitary, and rinsers aren't meant to wash dirty glasses. They're meant to cool *clean* glassware, wash away any dust or residual sanitizer, and prepare the surface to receive beer.

Take a moment and think about it: everybody has placed their mouths on their glasses. If you use a rinser on used glasses, every glass contributes leftover beer and mouth germs to the next glass in the line-up. It would be like passing around a single straw for everyone to drink through and only rinsing it with water in between each use. If that doesn't sound appealing to you, that's what's happening when glass rinsers are applied to used glasses. This was never the intended use of these devices: rinsing is not washing. Even if a sanitizer solution is being used, sanitizing is not cleaning; it's the second in a two-step process that starts with cleaning. Try soaking your soiled carboy in Star San and you'll see what I mean.

HOW OFTEN SHOULD BEER LINES BE CLEANED?

Here's one of the dirty secrets of the beer world (pun totally intended). Draught lines are often woefully unclean and in need of replacement. Why? Because cleaning beer lines is an added expense, and some bar owners think you won't notice the difference. According to Micro Matic training literature, the Brewers Association's *Draught Beer Quality Manual*, and most professional beer organizations, draught lines and accompanying hardware should be cleaned every two weeks. Anything less means buildup of microbial off flavors and a compromised product.

There are a number of signs that your beer is being served from a dirty tap line. Ever get a whiff of butter or movie theater popcorn in your beer? How about the taste of vinegar or the smell of rotten eggs? If you're a homebrewer who pays strict attention to sanitation before kegging, chances are your beer has been sitting in a draught line filled with off-flavor-producing bacteria. Sounds appetizing, I know. If you want to learn more about this (and you should),

do yourself a favor and download the free *Draught Beer Quality Manual* from the Brewers Association at draughtquality.org.

As a side note, if your favorite watering hole doesn't post the last time its lines were cleaned, then ask. You have a right to know.

WHY YOU WANT FOAM ON YOUR BEER

Ever been served a beer poured right to the top with no foam or hear someone complain that foam is a waste of precious beer space? There is good reason why beer is meant to have a head or collar of foam. Foam creates a barrier of CO₂ to prevent loss of flavor, keeps stomach bloating to a minimum, and releases aromatics for enhanced flavor. Furthermore, it's the way the brewery intended the beer to be served, it's more visually appealing, and it keeps bars from overserving customers.

If you serve a beer without any foam, it means you haven't released the gas in the beer that was supposed to be liberated during the pour. Instead, it's going to be released in your friends' stomachs. If you've ever felt bloated and gassy right after drinking a beer, there's a good chance it wasn't poured right. Besides being more visually appealing, a proper collar of foam greatly enhances the tasting experience.

GLASSWARE REALLY DOES MATTER

Please, enough with the shaker pint glasses already! Sure, they're stackable and fit nicely on shelves but they are among the worst options for flavor. These glasses were designed to fit snugly over cocktail shakers for mixing cocktails, thus the "shaker" glass name—they were not designed for beer. Glass shape is an important factor in how you perceive beer. There are myriad different glasses designed for different beer styles. In fact, in countries like Belgium, beer is frequently only served from brewery-specific glassware.

Glass shape and size accentuate different features of the beer with respect to aroma, appearance, and flavor. Try taking a beer and pouring it into a pint glass, a tulip glass, and a snifter; look it over, give it a swirl, sniff it out a bit, and take a few sips. I guarantee they'll seem different.





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The shape of a shaker pint glass mutes the aroma, and aroma accounts for the majority of flavor. Try holding your nose the next time you eat something, and then release mid chew to see what I'm talking about. If you're looking for maximum flavor, choose the right glass for the right beer. Randy Mosher's seminal *Tasting Beer: An Insider's Guide to the World's Greatest Drink* goes into great detail on various beer glasses.

REFUSE THE FROSTED GLASS

Although macro brewers advertise the virtues of ice-cold beer—even going so far as to create cans with decals that change colors near the freezing point of water—frosted glassware is the last thing from which you want to drink your homebrew. Ice crystals create foaming problems during pouring, pick up off-flavors from the freezer, and may contain liquid sanitizers that were meant to be rinsed away.

If those aren't enough reasons to stop this practice, here's one more. Beer at near-freezing temperatures numbs your taste buds, which delivers a less-flavorful tasting experience. So that double-dry-hopped double IPA you brewed with those expensive designer hops is now missing much of its flavor. Frozen glassware compromises the flavor of your beer, so keep the glassware at room temperature and rinse with cool water just prior to pouring.

FINAL RALLYING CRY

Armed with your new advice, go forth and pour your beer confidently for friends and neighbors alike. And just like Homeland Security, if you see something, say something! From your buddy's basement bar to the loftiest craft beer establishments, poor serving practices won't change until we, as consumers and fellow homebrewers, do our best to standardize accepted best practices.

Let us all raise a clean, style-appropriate glass, poured properly through a well-maintained tap system, to our newfound knowledge and to Howard Beale, who famously shouted out a window, "I'm as mad as hell, and I'm not going to take this anymore!"

Cheers!

Andrew Luberto is a member of the Long Island Beer and Malt Enthusiasts (LIBME) and a frequent contributor to Zymurgy.

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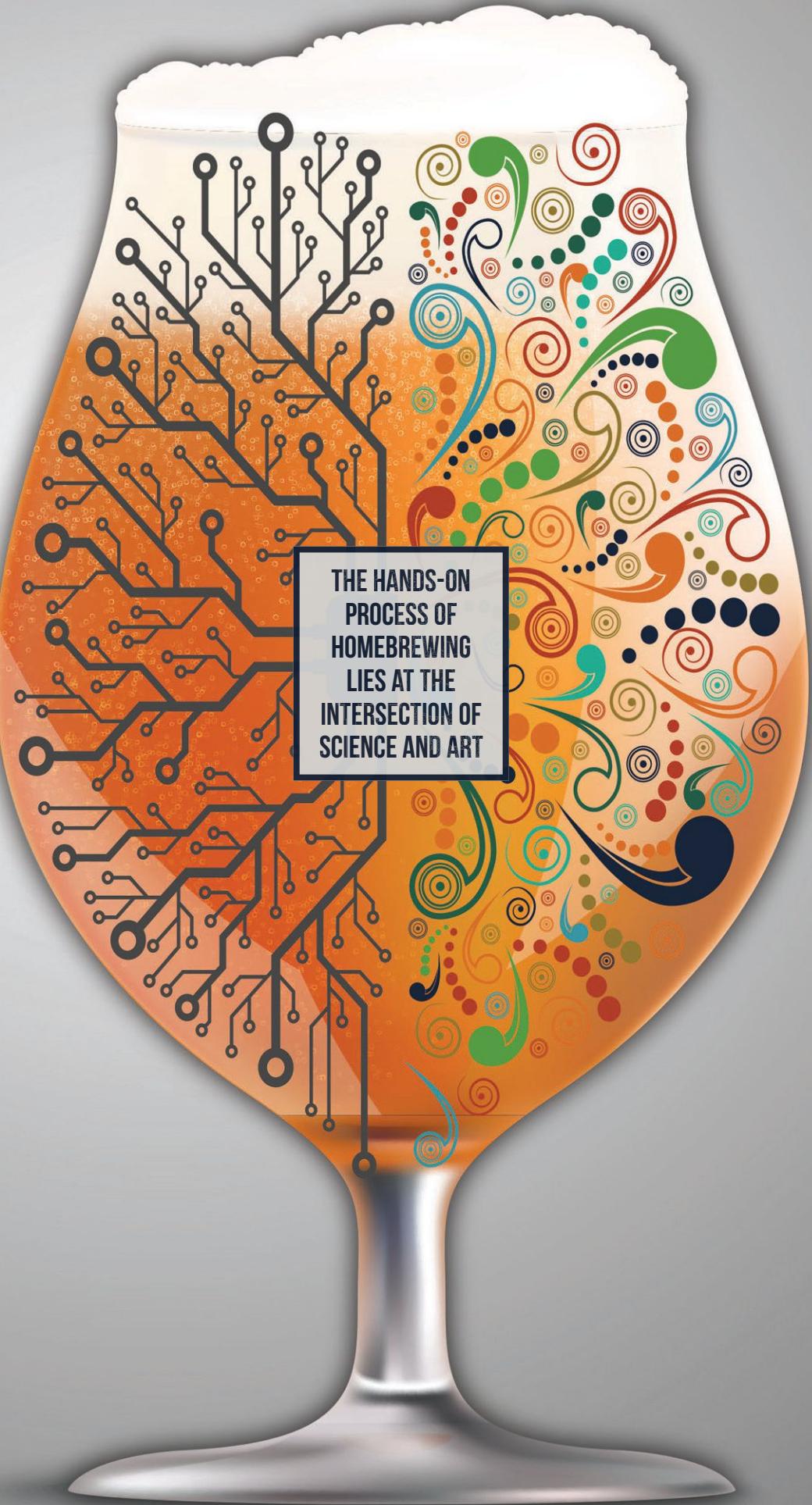


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THE HANDS-ON
PROCESS OF
HOMEBREWING
LIES AT THE
INTERSECTION OF
SCIENCE AND ART

ENGINEERING BETTER BEER & MEAD

By *Melissa Dempsey*

THE HANDS-ON PROCESS OF HOMEBREWING LIES AT THE INTERSECTION OF SCIENCE AND ART, WHERE CREATIVITY IS ENCOURAGED BUT CERTAIN LOGICAL RULES ARE SET IN PLACE. THESE DISTINCT ASPECTS ARE OFTEN CITED AS REASONS WHY A GROWING NUMBER OF ENGINEERS ARE ATTRACTED TO HOMEBREWING.

Of course, you don't need to be an engineer to make good beer, but there are some advantages to having a background in the sciences and analytical design fields. For instance, a mechanical engineer may experience less downtime when a pump needs repair, while environmental engineers could benefit from a deeper understanding of the microbiology of fermenting. Engineers of all stripes tend to share a keen ability to succinctly organize data, are drawn to orderly processes, and are driven to solve problems, especially those that result in the creation of something usable (or delicious).

"Thank goodness I kept my lava lamp," says Mike Volpe, a homebrewer from West Chester, Pa. He goes on to explain, "In winter, it's difficult to keep beer warm during fermentation when yeast activity begins to slow down. I keep my fermenter inside of a chest freezer during fermentation; the freezer helps for when I need to keep temperatures down, but conversely, since it's insulated I can also use it for the opposite case. I have a programmable switch that will turn on and off depending on the temperature setting I program it to. If the beer temperature is too high, the switch will automatically turn the chest freezer on. But if the beer gets too cold, I plug the lava lamp into the switch. The little light bulb inside safely provides the perfect amount of heat for achieving the results I need." →

Brew
This!



WRY SMILE

Rye IPA

Recipe courtesy Denny Conn

Batch volume: 5 US gal. (18.9 L)
Original gravity: 1.074 (18°P)
Final gravity: 1.020 (5.1°P)
Color: 12 SRM

Bitterness: 77 IBU
Efficiency: 70%
Alcohol: 7.2% by volume

MALTS

11 lb. (4.99 kg) pale malt (2-row)
3 lb. (1.36 kg) rye malt
1.25 lb. (0.57 kg) crystal 60L

0.5 lb. (227 g) Cara-Pils/dextrin malt
0.5 lb. (227 g) wheat malt

HOPS

1 oz. (28 g) Mt. Hood, 5.1%, FWH
1.25 oz. (35 g) Columbus, 16% a.a. @ 60 min
0.5 oz. (14 g) Mt. Hood, 5.1% a.a. @ 30 min

1.5 oz. (42 g) Mt. Hood, 5.1% a.a. @ 0 min
1 oz. (28 g) Columbus, 16.5%, dry hop 7 days

ADDITIONAL ITEMS

1 tsp. (5 g) Irish moss @ 15 min

1 tsp. (4 g) gypsum @ 60 min

YEAST

Wyeast 1450 Denny's Favorite 50

BREWING NOTES

Single infusion mash at 153°F (67°C) for 60 minutes. Boil 75 minutes, adding hops as indicated. Ferment at 65°F (18.3°C).

EXTRACT VERSION

Replace the pale malt, rye malt, and wheat malt with 9.5 lb. (4.3 kg) rye liquid malt extract syrup. Steep the crushed crystal malt and Cara-Pils for 30 minutes in 150°F (65.6°C) water, remove grains, and dissolve extract completely in the resulting wort. Proceed with the boil.

Volpe is a mechanical engineer by trade. His background includes manufacturing for a machine shop that built aircraft parts for companies such as Boeing, as well as designing automation machinery used for packaging lines at GE and Johnson & Johnson. He currently works as a mechanical engineer designing and refurbishing machinery for drilling rig manufacturers. With his strong understanding of building and design, he was able to not just solve a problem, but do so with the tools he already had on hand.

"I have a poor-man-who-is-also-lazy kind of setup at home," says Volpe. "I'm sure if I had more money and time to throw at it, I could design a killer rig that would add efficiency to the process."

A member of the Brewers United for Zany Zymurgy (BUZZ) homebrew club, Volpe tends to gravitate toward English-style beer, though he's made his fair share of American-style pale ales and IPAs. A

favorite recipe is his Peppermint Porter, which he typically brews in late autumn to be ready for drinking around Christmas. "The mention of peppermint sometimes can raise an eyebrow," he says. "I've had to tell people on multiple occasions, 'Believe me, it tastes way better than it sounds!'"

Volpe jumped into brewing seven years ago after buying a 5-gallon starter kit from Northern Brewer. A year later, he began volunteering at now-defunct West Chester microbrewery Boxcar Brewing Co. There, he gained hands-on experience, which he deems more important than simply having the know-how.

"There are random bits of my procedure that are influenced by things I've learned in school or at work, or simply by my analytical nature," Volpe says. "It certainly helps that I have some education in subjects like chemistry and biology, which leads to an understanding of things like water profile and pH, enzyme



Denny Conn enjoys Westvleteren 12 at In de Vrede in Westvleteren, Belgium.



Scott Aufderheide's honey before it becomes mead.



Scott Aufderheide's blueberry mead.



BLUEBERRY VICE MELOMEL

Recipe courtesy Scott Aufderheide

Session-style meads are notoriously difficult because they often taste weak and watery. Blueberries are a great fruit for this style because they have good natural tannins and some acidity. If you taste this after it ferments to completion but before you back-sweeten, you might be surprised by the lack of blueberry flavor. That's because some sugar needs to be present for the blueberry flavor to properly assert itself and be recognized.

You may think 20 lb. of blueberries is a lot, but 3 lb. per gallon is actually the standard. I went with 4 lb. per gallon for added flavor and presence. The measured original gravity may be much lower than the true original gravity since the sugar in the berries takes time to release.

A 6.5% ABV mead might not seem very sessionable. But again, because it's hard to get good flavor in a session mead, enough honey needs to be added to make a good impression. Oak adds structure and flavor and rounds out the edges quickly after fermentation.

Back-sweetening gives general body and added flavor. The target sweetness of 1.015 is a good medium point—it isn't overly sweet thanks to the balancing effects of berry and oak tannins and carbonation. All the components of this recipe have been targeted and used to make a nicely balanced and flavorful session mead that's hard to put down (hence "vice" in the name). Make tweaks at your own risk, or at least consider their effect on balance.

Pectic enzyme and bentonite cannot be added together because bentonite denatures the enzyme, so wait a day between additions. Bentonite in primary is easily kept in suspension by the turbulence of fermentation, making it very effective. The combination yields a very clear mead almost immediately after fermentation ends. Fermaid O and GoFerm ensure a good, healthy fermentation with all the proper nutrients for the yeast. Sorbate and metabisulfite are stabilizers and an antioxidant to make sure fermentation doesn't restart after back-sweetening.

Batch volume:	5 US gal. (18.9 L)
Original gravity:	1.045–1.050 (11.25–12.5°P)
Final gravity:	0.995–1.000 (-1.25–0°P)
Alcohol:	5.9–7.2% by volume

FERMENTABLES

20 lb.	(9.07 kg) blueberries
8 lb.	(3.63 kg) wildflower honey

OTHER INGREDIENTS

2 oz.	(57 g) medium toast American oak cubes
1 Tbsp.	(15 mL) pectic enzyme
2 tsp.	(10 mL) bentonite
6.25 g	GoFerm
7.9 g	Fermaid O
1 Tbsp.	(15 mL) potassium sorbate
0.5 tsp.	(2.5 mL) potassium metabisulfite

YEAST

5 g	Lalvin ICV-D47 yeast
-----	----------------------

BREWING NOTES

To prep, freeze your blueberries for at least 24 hours. Then pick out and discard any that have mold or look off, although smashed berries are fine. Possibly grab an extra pound to compensate for the loss of these throwaways.

Day 0

Mix 6.25 g GoFerm with about 125 mL of 110°F (43°C) water until it dissolves completely. When the mixture reaches 104°F (40°C), sprinkle yeast on top to rehydrate and leave for about 20 minutes.

Of your 8 lb. (3.63 kg) of honey, mix 5 lb. (2.27 kg) in with 2.5 gallons (9.46 L) of warm water to dissolve. Save the remaining 3 lb. (1.36 kg) for back-sweetening later.

Place berries in a mesh bag for easy removal later. Add the bag to the fermenter and fill with more water to reach 6 gal. (22.71 L). The berries will take up about 2–2.5 gallons (7.5–9.5 L) of space. Add 1 Tbsp. pectic enzyme to break down the pectin in the berries.

When yeast solution is ready, ensure it is within 10°F (6°C) of must temperature before pitching. Acclimatize the yeast if needed by adding a tablespoon of the must to the yeast slurry every 30 to 60 seconds.

Ferment at 62°F (17°C). If you are unable to keep berries submerged completely during fermentation, periodically open the fermenter and push them down to keep them wet. Do this at least every other day.

Day 1

Take a few ounces of the must (possibly the same used for the gravity measurement), mix in 7.9 g of Fermaid O, and return to primary. Attempt to degas some by stirring, but the bag of fruit can make this difficult. Add 2 tsp. bentonite by just sprinkling it on top (no need for the boiling water/slurry method).

Day 14

Fermentation should have finished between days 8 and 10. Remove the berry bag and squeeze out as much liquid as possible. Ideally you will have between 5 and 5.25 gallons (about 19–20 liters) at a gravity of 0.995–1.000. Cold crash for 3 days.

Day 17

Rack into secondary vessel. I like to use glass carboys to reduce headspace and to observe clearing. Whatever you use should be more air tight than an ale pail. Add 1 Tbsp. potassium sorbate, 1/4 tsp. potassium metabisulfite, and 2 oz. medium toast American oak cubes. Age 6–8 weeks to try to get the most out of your oak; longer is fine, but this is the minimum.

Around Day 65

Rack to a keg and add the remaining 1/4 tsp. potassium metabisulfite. Warm the remaining 3 lb. honey to loosen it, and add it to the keg to back-sweeten to about 1.015. Let keg sit at room temperature for 24–48 hours, shaking occasionally, to ensure the honey is completely dissolved.

Chill keg with a CO₂ head pressure of 8–10 psi (0.6–0.7 bar) for 1 week to carbonate.

Brew
This!



MIKE'S MILD

Recipe courtesy Mike Volpe

Batch volume: 5 US gal. (18.9 L)
Original gravity: 1.045 (11.25°P)
Color: 7 SRM

Bitterness: 30 IBU
Efficiency: 75%
Boil Time: 60 Minutes

MALTS

4 lb. (1.81 kg) Maris Otter malt
3.5 lb. (1.59 kg) pale malt (2-row)

0.5 lb. (227 g) Weyermann Carafoam malt
0.25 lb. (113 g) English Dark Crystal malt

HOPS

0.5 oz. (14 g) East Kent Golding, 5% a.a. @ 60 min
1.25 oz. (35 g) East Kent Golding, 5% a.a. @ 25 min
1.25 oz. (35 g) East Kent Golding, 5% a.a. @ 5 min

YEAST

Wyeast 1469 Yorkshire Square Ale Yeast, 0.71M cells/mL/°P

BREWING NOTES

Mash at 153°F (67°C) for 60 minutes. Ferment at 67°F (19°C).

EXTRACT VERSION

Replace the Maris Otter and pale malts with 6 lb. (2.7 kg) Maris Otter liquid malt extract syrup. Steep the crushed Carafoam and dark crystal malts for 30 minutes in 150°F (65.6°C) water, remove grains, and dissolve extract completely in the resulting wort. Proceed with the boil.



Mike Volpe checks on a batch of mild ale.

activity in the mash, and yeast cell behavior. At most, I'd say my background has given me more upfront preparation for understanding the science behind everything that's happening. But, education is always half the battle; you still need to get your hands dirty before you actually know what you're doing."

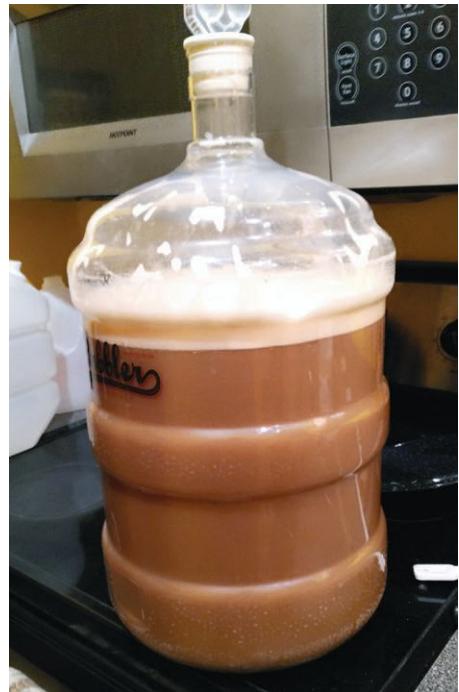
Dave Houseman is a retired computer engineer from Chester Springs, Pa., who's



Mike Volpe's mashing setup.

been brewing for 28 years. Not only is he a fellow member of the BUZZ brew club, but he cofounded it in 1993.

"I do think that engineers have an advantage because we are broadly trained in sciences and in the DIY skills of making things," Houseman says. "Homebrewing by definition is DIY. But making the equipment is also DIY. We're makers. We read and study. We analyze, plan, and organize.



Mike Volpe's mild ale ferments away.

We're creative. All of these things may provide a unique perspective."

On the other hand, sometimes a too-logical mentality can hold brewers back from taking creative risks. Software engineer John Scott of Brooklyn, N.Y. agrees. "I think it's hard or expensive to build a sophisticated homebrew house without being mechanically inclined; not that you can't make good beer with a stovetop pot and plastic bucket, but there are limits. I also think you stand a better chance of being consistent and improving if you approach brewing as an engineering problem," explains Scott, who is a member of the Brewminaries homebrew club. "But there's a lot to be said for creativity, and there are times when my engineer's mindset blocks me from trying something crazy that might end up being amazing. A fellow Brewminary once fermented mead in a pumpkin, and I believe it won some awards. I could never do that, but I'm really glad someone did."

Scott first got into brewing through a baking hobby. "I've always been a baker and feel like there's quite a bit of overlap there in terms of appealing to people like me who get excited about process, technique, precision, developing recipes, and understanding how the ingredients react with each other to affect the final product," he says. "Given that I like beer even more than cake, brewing seemed like a natural next step. And in fact, brewing has helped my sourdough game, as I have a much better understanding of yeast and *Lactobacilli*.



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CHATEAU GATES CYSER

Recipe courtesy Scott Aufderheide

This cyser scored a 45 at the 2019 Mazer Cup when it was 6 months old. My goal was to make a Chardonnay-style cyser. Chardonnays are often dry, oaky, and barrel fermented. You could attempt a malolactic fermentation step after the initial ferment, but that was beyond my scope this time, and I think the touch of lactic acid was good enough.

Since I didn't have a barrel, I used a lot of oak cubes in primary. The difference between fermenting on oak and using oak later is that during fermentation, the yeast will eat all of the vanillin, leaving only tannic, spicy, and smoky contributions from the oak and less vanilla and sweetness.

This mead ends up being around 11.5% ABV. While this is immediately ready to consume at the 8-week mark and quite pleasant, I found that letting it age for 6 months from pitch brought back a lot of the honey and apple flavors, and it became much more complex.

Pectic enzyme and bentonite cannot be added together because bentonite denatures the enzyme, so wait a day between additions. Bentonite in primary is easily kept in suspension by the turbulence of fermentation, making it very effective. The combination yields a very clear mead almost immediately after fermentation ends. Fermaid O and GoFerm ensure a good, healthy fermentation with all the proper nutrients for the yeast. Sorbate and metabisulfite are stabilizers and an antioxidant to make sure fermentation doesn't restart after back-sweetening.

Batch volume:	5 US gal. (18.9 L)
Original gravity:	1.085–1.095 (20.5–22.7°P)
Final gravity:	0.995–1.000 (-1.25–0°P)
Alcohol:	11.5% by volume

FERMENTABLES

5 gal. (18.9 L) unsweetened apple cider
6–9 lb. (2.7–4 kg) light-flavored honey (amount varies depending on cider gravity)

OTHER INGREDIENTS

1 oz. (28 g) medium-plus toast French oak cubes
1 oz. (28 g) medium-plus toast American oak cubes
0.5 oz. (14 g) medium-plus toast Hungarian oak cubes
Malic acid, to taste
Lactic acid, to taste
1 Tbsp. (15 mL) pectic enzyme
2 tsp. (10 mL) bentonite
12.5 g. GoFerm
10.1 g. Fermaid O
1 Tbsp. (15 mL) potassium sorbate
1 Tbsp. (15 mL) Sparkolloid (optional)
0.5 tsp. (2.5 mL) potassium metabisulfite

YEAST

10 g Lalvin ICV-D47 yeast

BREWING NOTES

Day 0

Mix 12.5 g GoFerm with about 250 mL of 110°F (43°C) water until it dissolves completely. When the mixture reaches 104°F (40°C), sprinkle yeast on top to rehydrate and leave for about 20 minutes. Mix cider and honey together until fully dissolved. Save 1 lb. (0.45 kg) of honey for back-sweetening later.

Add 1 Tbsp. pectic enzyme and all of the oak to the fermenter. Pitch yeast and ferment at 62°F (17°C).

Day 1

Take a few ounces of the must (possibly the same used to measure gravity), mix in 2.6 g Fermaid O, and return to primary. Add 2 tsp. bentonite by sprinkling on top (no need for the boiling water/slurry method).

Days 2 and 3

Stir enough to degas some, but not enough to aerate (avoid splashing and vortices). Mix 2.5 g. of Fermaid O with a sample of must and return to primary.

Day 4–7

Monitor gravity with daily hydrometer readings. On day 7, or when the gravity has fallen by 2/3 (whichever comes first), add the final 2.5 g Fermaid O feeding.

Day 18

Fermentation should end between days 10 and 12. Gently stir or swirl to get everything in suspension, and cold crash for 72 hours.

Day 21

Rack cyser and oak cubes from primary to secondary, and add 1/4 tsp. potassium metabisulfite and 1 Tbsp. potassium sorbate.

Day 25

Let sit for a few days, then back-sweeten with 1 lb. honey to about 1.002. A bone-dry gravity below 1.000 is generally unpleasant: here, back-sweetening is more to give a reasonable level of dryness than to actually make it sweet. Add an extra 1/4 tsp potassium metabisulfite to ensure stability.

Day 35

This depends entirely on the cider you use and the effect you are going for, but I add some acid additions of 13.7 g malic and 5.5 mL lactic to sharpen the mead. The amounts will depend on the cider, the honey, and your own personal tastes. Conduct acid trials to find the right amount for your mead.

Day 42 (Optional)

Back-sweetening will likely have made your mead cloudy again. If it doesn't clear on its own after a few weeks, mix 1 Tbsp. Sparkolloid with 1 cup boiling water and stir while boiling for 5 minutes. Add this to the mead and gently but thoroughly mix it in. You do not have to do this step if you are happy with the clarity of your mead. Let sit for 2 weeks.

Day 56

At this point, the mead has been 8 weeks on the oak. I think this is the minimum: I get a good tannic character without it being too oaky, but if you'd like to leave it on the cubes longer it should be fine. Otherwise, keg or bottle. If kegging, store at room temp and serve at 2 to 3 psi (140–200 mbar) to make sure it doesn't carbonate.

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Scott Aufderheide's cyser.



Scott Aufderheide's mash tun.

now. I've combined the two hobbies by regularly baking *Biertreberbrot*, a spent-grain bread, after a brew day."

Scott's two years of brewing experience have been focused on classic styles including a cream ale, IPAs, and a Maibock. By day, he's the CTO of Sports Systems, which builds software used for managing sporting events. Though he earned a degree in mechanical engineering, he has been a software engineer for more than 20 years and finds ways to use that experience to his advantage while brewing.

"My brew day tends to be pretty data driven, which I think helps me improve

with each iteration—or better understand why something failed," he says. "The biggest thing for me is just wanting to understand how everything works, from yeast to heat exchange, and then getting excited about optimizing a process and measuring the crap out of everything I can. It's a perfect hobby for some applied engineering, and the possibilities for geeking out are endless. The online community is full of examples of engineer-y people solving problems in interesting ways, from the now-standard Igloo-cooler-as-mash-tun to CO₂-capturing balloons used to reduce cold-side oxidation."

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WE READ AND STUDY.
WE ANALYZE, PLAN,
AND ORGANIZE.
WE'RE CREATIVE.
ALL OF THESE THINGS
MAY PROVIDE A
UNIQUE PERSPECTIVE."**

DAVE HOUSEMAN

Perhaps the correlation between working in an engineering field and homebrewing is simply having a creative drive combined with an inclination to figure things out that proves mutually beneficial for both activities. Joseph Socha of Columbia, Md., an electrical engineer who designs and analyzes electronic circuits, says he's able to apply his engineering background to many aspects of his brewing process by tapping into these traits.

"It helps when figuring out what brewing equipment to buy—cost, features, benefits—and it helps in adapting and repurposing other equipment," he says. "I took a nonfunctional wine fridge and turned it into a temperature-controlled fermentation chamber. Engineering requires a bit of creativity, and homebrewing does as well. The difference is that engineering-creativity has very wide audience, but for me, homebrewing is more about what I enjoy. Yes, I want people to like my beer, but I brew for me, not for them."

Socha points out another commonality between the two fields: both have seen a relatively recent growth in women. "I am lucky to work at a large company that is the most diverse, at all levels, that I have ever worked for. They continue to have several initiatives to encourage women joining the company and I hope more women go into engineering and the related technical fields," Socha says. "Also, I attended my first Homebrew Con in 2012, and it's my perception that [the number of] women who are leading sessions and participating, not just attending, is on the rise."

Although I didn't interview female engineers who homebrew for this particular article, I know you're out there and acknowledge you. According to the Society of Women Engineers (SWE), as of 2018, only about 13 percent of engineers in the US workforce were women. But, between 2011 and 2016, there was a 54 percent increase in bachelor's degrees in engi-



PEPPERMINT PORTER

Recipe courtesy Mike Volpe

Batch volume: 5 US gal. (18.9 L)
Original gravity: 1.068 (16.5°P)
Final gravity: 1.014 (3.6°P)
Color: 22 SRM

Bitterness: 29 IBU
Efficiency: 75%
Alcohol: 7.2% by volume

MALTS

5.5 lb. (2.49 kg) pale malt (2-row)
4 lb. (1.81 kg) Maris Otter malt
2 lb. (907 g) flaked oats

0.5 lb. (227 g) chocolate malt
6 oz. (170 g) Extra Dark Crystal Malt

HOPS

1 oz. (28 g) Willamette, 5% a.a. @ 60 min
1.25 oz. (35 g) East Kent Golding, 5% a.a. @ 25 min
1.25 oz. (35 g) East Kent Golding, 5% a.a. @ 5 min
1.5 oz. (42 g) Mt. Hood, 5.1% a.a. @ 0 min

OTHER INGREDIENTS

15 single-serving bags peppermint tea, steeped at flameout for 5 min
1–2 oz. (28–57 g) whole coffee beans, in secondary

YEAST

11 g (1 sachet) Nottingham Ale Yeast

BREWING NOTES

Mash at 156°F (69°C) for 60 min. Boil 75 min. Steep tea bags in wort for 5 minutes, then discard. Chill and oxygenate. Ferment at 64°F (18°C) to final gravity. Steep coffee beans at 67°F (19°C) for 24 hours. Package.

PARTIAL-MASH VERSION

Replace the Maris Otter and all but 2 lb. (907 g) of the pale malt with 5.5 lb. (2.5 kg) Maris Otter liquid malt extract syrup. Mash 2 lb. pale malt with oats and remaining malts for 60 minutes at 156°F (69°C). Sparge with hot water, dissolve extract in the wort, and proceed with the boil.

neering and computer science earned by women. Growth in the field has been slow, but there is an increased female workforce ready to jump in when the jobs become available.

When it comes to craft beer, the numbers of female consumers and brewers have both increased. Memberships in the Pink Boots Society, the mission of which is “to assist, inspire, and encourage women beer industry professionals to advance their careers through education,” has grown from fewer than 20 at its inception in 2007, to about 2,400 in 2019, with nearly 80 chapters throughout the country. With growth in both fields, it’s only a matter of time before the two converge further as it has for men.

Overall, homebrewing offers engineers a problem-solving hobby that combines the structure, creativity, science, and art that engineers find exciting. While there are often some rights and wrongs, other parts of brewing have no definite answer, with

countless ways of filling in those blanks.

“Sure, it’s great to make beer, but it’s the making of the beer that I find fascinating,” says Denny Conn of Noti, Ore. An audio engineer for 50 years who now coproduces the *Experimental Brewing* podcast, along with having written multiple books on brewing with fellow brewer Drew Beechum, he doesn’t exactly apply his trade to his brewing. But Conn, a veteran brewer with more than 20 years of experience crafting IPAs, APAs, Belgians, and lagers, says that his engineer mindset has provided a unique advantage: “I have a problem-solving attitude and a deep desire to understand how things work, and why,” he says. “It’s led to my pragmatic brewing style and questioning of conventional wisdom.”

The same can be said for computer engineering, where even the most minute details matter, and a solid problem-solving mentality is a must. Brooklyn-based brewer Scott Aufderheide works as a software engi-

neer for Disney; his job is to develop and maintain proprietary software and tools used to produce animated movies while supporting artists and workflows by troubleshooting their shots and setups.

“I don’t think my background in engineering specifically has given me an advantage; for computer science it’s more of an indirect benefit for brewing,” he explains. “I have made a couple programs and spreadsheets to help me with calculations for various additions and organization. I also really like data and graphs, so I like to keep detailed notes and then plot out that information to compare brews, usually to see how different yeast perform under different conditions.”

PERHAPS THE CORRELATION BETWEEN WORKING IN AN ENGINEERING FIELD AND HOMEBREWING IS SIMPLY HAVING A CREATIVE DRIVE COMBINED WITH AN INCLINATION TO FIGURE THINGS OUT THAT PROVES MUTUALLY BENEFICIAL FOR BOTH ACTIVITIES.

He likes brewing more traditional styles like Scottish ales, Irish stouts, and hefeweizens, but he only makes one or two beers a year. His preference is for mead, and he makes up to 10 batches annually.

“I typically like to make a cyser each fall and a session mead for the summer and then try out different honeys for traditionals and fruits for melomels throughout the year,” he says, adding that the notions that drove him toward engineering are the same that he enjoys about brewing: testing, scrutinizing, and creating new processes.

“Half the fun is experimenting, learning, and trying new things. It’s part of who I am to be constantly learning,” he says. “The other half is the satisfaction of making something really good and enjoying it yourself, then sharing it with others. I think most engineers are just drawn to the complexity and problem-solving aspect. We like to tinker and test, and our brains are always thinking of something new, and brewing is a perfect playground for that.”

Melissa Dempsey is a freelance writer from New York’s Hudson Valley specializing in travel, food/drink, and lifestyle articles. Learn more at melissacdempsey.com.



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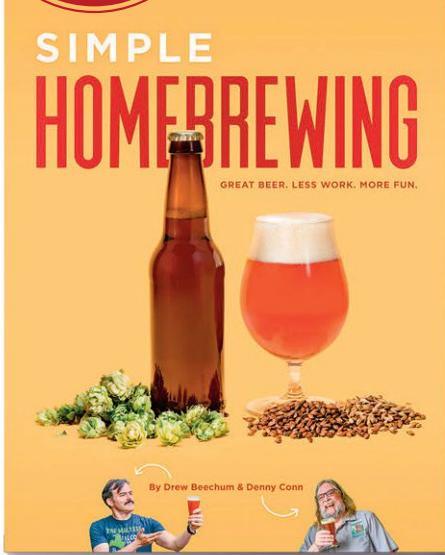
Zymurgy's 2019 **HOLIDAY GIFT GUIDE**

By Zymurgy editors

27 new and/or noteworthy items for the homebrewers and beer lovers on your list.

Be sure to check out your local homebrew supply shop for many of these items and more gift ideas!

FOR THE
Book Lover



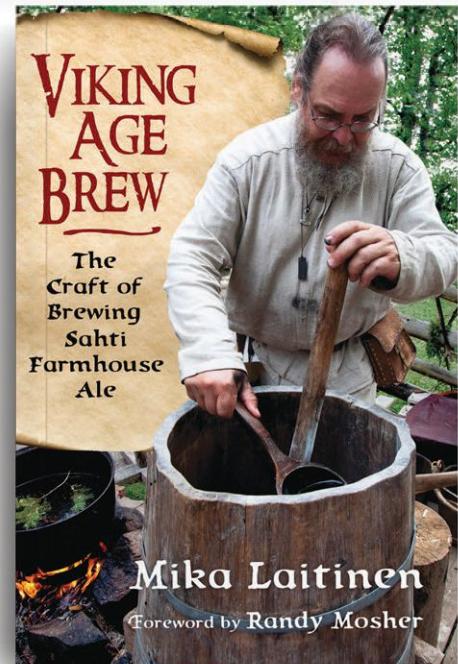
SIMPLE HOMEBREWING

By Drew Beechum & Denny Conn

Learn to brew the best possible beer with less work and more fun! *Simple Homebrewing* reduces the complicated steps for making beer and returns brewing to the fundamentals. Pick up tips and tricks for a range of brewing challenges like making water adjustments, working with adjunct ingredients, and brewing wild beers. *Simple Homebrewing* helps you develop a simple, thoughtful brewing process and makes homebrewing more accessible and enjoyable. Even experienced homebrewers will learn a thing or two (or more) from this famous duo. For a taste of what Drew and Denny offer in this book, check out "Simple Water Adjustment" in the May/June 2019 issue of *Zymurgy*.

BrewersPublications.com

\$19.95



VIKING AGE BREW: THE CRAFT OF BREWING SAHTI FARMHOUSE ALE

By Mika Laitinen

Zymurgy readers already know Mika Laitinen's work from his article "Sahti: A Viking Age Homebrew" (March/April 2019). In *Viking Age Brew*, Laitinen takes a deep dive into the tradition, culture, history, and brewing techniques of Finnish sahti. Far from a single, well-defined style, sahti actually encompasses a wide spectrum of approaches and finished products, the diversity of which Laitinen celebrates in this book. With recipes from accomplished sahti brewers and suggestions on how to mimic traditional techniques in your own kitchen, *Viking Age Brew* is essential reading for anyone interested in brewing these Nordic farmhouse beers.

brewingnordic.com

\$19.99

THE GUIDE TO CRAFT BEER

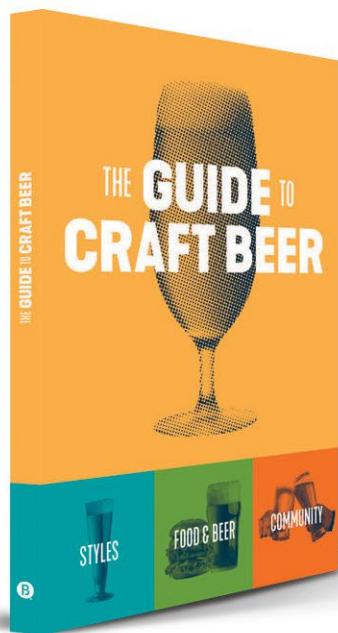
By the editors of Brewers Publications®

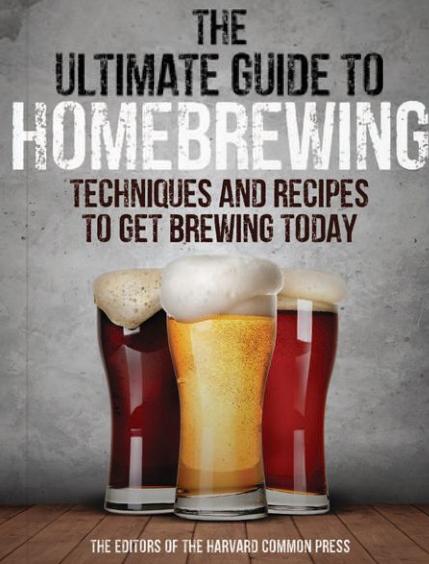
Now is the best time in US history to be a craft beer lover. More than 7,000 breweries are reinvigorating the beer scene with traditional styles and using American ingenuity to brew beers that push boundaries.

These small and independent breweries are changing the way we think about beer. *The Guide to Craft Beer* explains what craft beer is and how breweries are building community in their local areas. Dive into more than 80 style summaries, learn what you might like, and find new styles to seek out. Develop your own tasting adventure with beer pairing tips for different styles and types of foods that marry well with them. Record your personal journey using the tasting log included in each book.

BrewersPublications.com

\$12.95





THE ULTIMATE GUIDE TO HOMEBREWING

By the editors of Harvard Common Press

This full-color manual is chock full of recipes that homebrewers of all levels can enjoy making. The generous assortment of homebrew-sized professional recipes includes Smoke (Surly Brewing Co.), Saison Rue (The Bruery), Allagash Curieux (Allagash Brewing Co.), and Nugget Nectar (Tröegs Brewing Co.), among many others. A large vintage beers section offers recipes for 1804 Barclay Perkins, 1910 Fuller's Porter, 1883 Guinness Extra Stout, and 1890 Paulaner Salvator. The editors were kind enough to share one of the book's recipes, Big Mama's Barley Wine, with Zymurgy readers (see below).

quartoknows.com

\$27.99

Brew This!



Big Mama's Barley Wine

Recipe printed with permission of Harvard Common Press and adapted by Zymurgy to fit available space

Barleywines get their name because they have alcohol levels more closely associated with wine than traditional beer. They tend to follow a simple grain recipe and gain their complexity through heightened alcohol, yeast esters, and profound hop presence in both the nose and the mouth. To bump up the alcohol in this recipe, a good amount of brown sugar and some raisins will be added. To bump up the hop profile, you will do some wort hopping (adding hops before the beer starts boiling) in addition to dry hopping the beer in the carboy during primary fermentation. Regular ale yeast might have a tough time fermenting this 11% ABV beer all the way to completion. For this reason, a Champagne yeast will be added late in fermentation (along with a bit more brown sugar to get the yeast working more quickly) and yeast nutrient (available from homebrew supply stores) to ensure complete fermentation.

In addition to your standard brew gear, you'll also need a food processor, a second small cooking pot, and a second stirring spoon

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.105 [24.9°P]

Final gravity: 1.020 [5.1°P]

Alcohol: 11% by volume

MALTS

2 lb. [900 g] 20°L crystal malt
9.9 lb. [4.5 kg] light liquid malt extract @ 65 min

HOPS

2 oz. [57 g] Warrior pellets @ 60 min
0.5 oz. [14 g] Cascade leaf @ 60 min
(separate pot)
2 oz. [57 g] Centennial pellets @ 20 min
0.5 oz. [14 g] Cascade leaf @ 10 min
1 oz. [28 g] Centennial pellets,
4–5 days into fermentation

ADDITIONAL ITEMS

2 tsp. [8 g] gypsum
2 lb. [900 g] light brown sugar @ 65 min
1 lb. [455 g] golden raisins @ 60 min
(separate pot)
1 tsp. [4 g] Irish moss @ 20 min
5 tsp. [25 g] yeast nutrient,
4–5 days into fermentation
0.5 lb. [227 g] light brown sugar,
4–5 days into fermentation
5 oz. [142 g] priming sugar (if bottling)

YEAST

Primary: Wyeast 1056 or White Labs WLP001
American Ale

Secondary: Wyeast 4021, Safale US-05, Red Star
Champagne, or Lalvin EC-1118

BREWING NOTES

Fill a grain bag with the crushed crystal malt and a second bag with 1 oz. (28 g) whole-leaf Cascade hops. Tie off the tops and place the bags in your brewpot filled with 4 gal. (15.1 L) cool water. Add 2 tsp. (8 g) gypsum. Heat the pot and stir every 5 minutes.

When water reaches 170°F (77°C), remove the specialty grain bag and hold it above the brew pot for a minute, allowing most of the liquid to drain into the pot. Do not squeeze the grain bag. Leave the hop bag in the brewpot.

When the water begins to boil, remove pot from heat and add malt extract and 2 lb. (900 g) light brown sugar, stirring to prevent clumping and scorching. Return the pot to the heat and bring to a boil. Boil 5 minutes, add Warrior hop pellets, and stir. Set the timer for 60 minutes, adding hops and Irish moss as indicated.

Meanwhile, heat 12 oz. (355 mL) water in a second pot, bring to a boil, and remove from heat. Add 0.5 lb. (227 g) golden raisins and the whole-leaf Cascade (loose, not in a bag) to this water to

hydrate. Stir occasionally as it cools.

At 5 minutes before the end of the main boil, purée the mixture of raisins, hops, and water that was in your second cooking pot. Once this mixture is a thin paste in consistency, add it to your brew pot. Stir for 1 minute.

At knockout, stir wort for 2 minutes to create a whirlpool. Stop stirring and allow to sit for 10 minutes. Chill wort to 70–75°F (21–24°C), transfer to a carboy, and aerate 1 minute. Pitch the ale yeast and aerate another minute. Top up to 5 gal. (19 L) with cool water.

After the vigorous primary fermentation slows (around day 4 or 5), hydrate Champagne yeast in 1 cup (235 mL) warm water (less than 95°F [35°C]) and stir well with a sanitized spoon. Put 0.5 lb. (227 g) brown sugar in 2 cups (470 mL) of 170°F (77°C) water to dissolve. Add the hot sugar water and hydrated Champagne yeast to the carboy along with the final ounce (28 g) of Centennial hop pellets, and replace the airlock. Secondary fermentation should last another 2–3 weeks. In another 2 weeks or so, your beer should be clear and ready to package.

Your beer should be ready to drink 3–4 weeks after packaging. Due to its higher alcohol content, this beer is slow to carbonate in bottles. This is a long keeper and because of the high alcohol content will age well.

LET'S
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This!



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Share the love! This prepaid one-year membership card just needs to be activated by the recipient to join the 44,000+ members of the AHA who enjoy benefits such as Zymurgy magazine, the Brew Guru® app, and the AHA Member Deals program, with discounts at more than 2,300 breweries, brewpubs, homebrew shops, and more. All gift cards purchased by December 17, 2019, include your choice of a brewing book and free shipping.

Pro tip: Activate the gift card by December 31, 2019, and you're entered to win tickets and hotel accommodations to the 2020 Great American Beer Festival in Denver.

HomebrewersAssociation.org
Starting at \$38.00



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Airlock suckback. We've all experienced it at one time or another, especially when cold crashing. Not only does creepy airlock fluid get into your beer, but so can oxygen. Eliminate both problems with this innovative CO₂ harvester from NorCal Brewing Solutions. Simply take two Mason jars (you provide them), install the custom stainless lids, connect hoses, and pop on a standard three-piece or S-shaped airlock. This double-chamber über-airlock collects natural carbon dioxide produced during fermentation and saves it for a later date. When it's time to cold crash, your fermenter tops itself back up with CO₂: no suckback, no oxygen. Why didn't we think of this?

norcalbrewingsolutions.com
\$49.99

ETEKCITY LASERGRIP 774 NON-CONTACT DIGITAL INFRARED THERMOMETER

The only thing better than having a good thermometer in your homebrewer's quiver is having several good thermometers. This infrared thermometer instantly reads a temperature from afar. No need to get out of your chair to check the strike water. With a beer in one hand and this temperature gun in the other, you can continue relaxing until it's time to mash in. With a range that spans -58°F to 716°F (-50°C to 380°C), it comfortably covers all the temperatures of interest to homebrewers, as well as hot and cold extremes we hope to never encounter. We're also told it's helpful for measuring the temperature of dogs' hind legs, garage floors, house siding, hawks' wings, and other useful applications.



etekcity.com
\$15.99

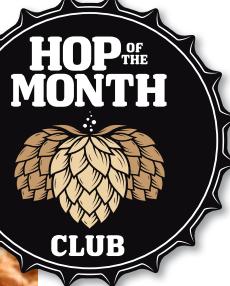


BREWBUILT COOLSTIX

There was a time when digital fermentation temperature control meant devoting significant space to a refrigerator or chest freezer. Thankfully, homebrew fermentation technology has come a long way in recent years. Take these BrewBuilt CoolStix, for example. Just drop one into the fermenter of your choice—in addition to the universal model, special versions are available to fit carboys, Spiegel fermenters, and Tri-Clamp ports—hook up the hoses, and let your fermentation cool from within. If you opt for a complete kit, you also get a thermowell, digital temperature controller, submersible pump, and all the fittings you need to hook it all up.

morebeer.com

Starting at \$79.99



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Clark, that's the gift that keeps on giving the whole year. Ditch the jelly and set your sights on a year of lupulin instead. Subscriptions are available for 4-, 8-, and 16-ounce packs, and you can go for as many months as your hoppy heart desires.

hopofthemonthclub.com

Starting at \$15.00



CUISINART DOUBLE INDUCTION COOKTOP

Whether you're boiling a decoction, cooking a cereal mash, or preparing starter wort, sometimes you just need an extra heat source. This dual induction cooktop from Cuisinart fits the bill twice. The left and right burners offer 8 and 5 individual heat settings, respectively, and both feature timers of up to 150 minutes.

cuisinart.com **\$199.95**

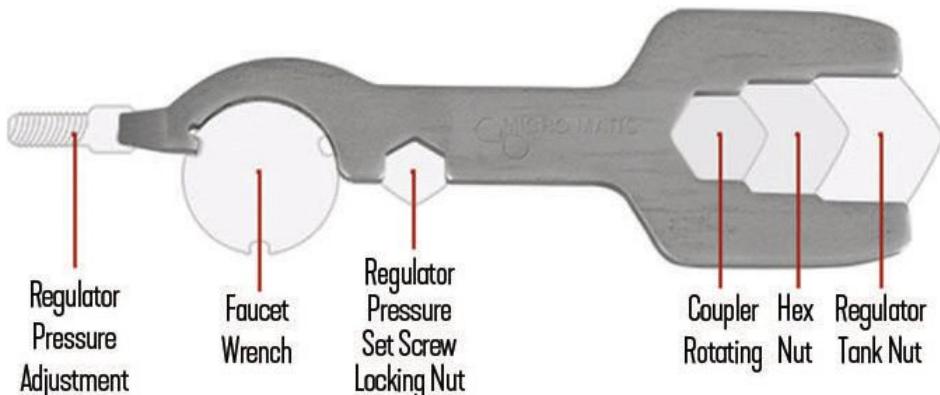


THE STASIS GLYCOL CHILLER

If ice-water reservoirs aren't getting you the lagering temperatures you want, maybe it's time to consider glycol. Previously accessible only to professionals, the price and complexity of large glycol chillers have been scaled down to homebrew size in The Stasis from Craft A Brew. Unlike many other chiller setups, this one includes all the pumps and thermostats you need, so it's a true plug-and-play solution, except for the user-supplied propylene glycol. The manufacturer says it'll take your beer down to as cold as 36°F at a rate of 1,700 BTU per hour (that's 2°C and 500 watts).

craftabrew.com
\$659.00

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micromatic.com
\$24.98



PITTSBURGH AUTOMOTIVE 1500-POUND CAPACITY ATV/ MOTORCYCLE LIFT

We know what you're thinking: what on earth does a motorcycle jack have to do with homebrewing? Well, maybe you live in a small space. Or perhaps your back doesn't work quite as well as it used to [ours certainly doesn't]. Either way, if you rely on gravity to move beer, there comes a time when the donor vessel needs to be raised above the receiving vessel. This motorcycle jack can do the heavy lifting and hoist a full carboy or bucket 12 inches into the air. Don't risk personal injury: let this lift elevate your brewing.

harborfreight.com
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BREW Accessories



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dropandcatch.com
Starting at \$35.00



TOADFISH NON-TIPPING CAN COOLER

We've all spilled beer, some of us more than others (see Ferment on This, Sept/Oct 2019), but such accidents aren't always due to homebrew consumption. Sometimes you're just on a boat and that's the way it is. Toadfish Outfitters has just the solution for maritime mishaps with this insulated Non-Tipping Can Cooler. Featuring a suction cup and double-wall vacuum insulation, these beverage coolers ensure your drink remains upright and cold.

toadfishoutfitters.com
\$24.00

INGREDIENTS RAGLAN T-SHIRT

Show off your homebrewer pride with this super-soft T-shirt. Featuring three of beer's

four essential ingredients—yeast is too small to realistically caricature—those who already get it will continue getting it, and those who don't will ask you how to start.

HomebrewersAssociation.org
(look for SHOP)
\$24.99



AHA THERMAL COOLER

These 11-ounce coolers are designed with the homebrewer in mind. Fill it with 11 ounces of your favorite brew and leave that last bit of sediment behind in the bottle. Or, you know, you can always use it for coffee.

HomebrewersAssociation.org
(look for SHOP)
\$14.99



SPIEGELAU CRAFT BEER TASTING KIT

Well-made, style-appropriate glassware can dramatically enhance your beer tasting experience (see "Past the Finish Line" by Andrew Luberto on page 38 of this issue of *Zymurgy*), but you don't necessarily need to stock a different glass for every single style. This Craft Beer Tasting Kit from Spiegelau includes four versatile glasses, all of which are several steps above the ubiquitous shaker pint. Although named for their intended styles—IPA, Stout, American Wheat Beer, and Barrel-Aged Beer—these glasses can cover a wide variety of beer styles. Spiegelau collaborated with brewers at Dogfish Head, Sierra Nevada, Left Hand, Bell's, Cigar City, and other renowned breweries to design these fancy beer holders, so you know their pedigree is legit.

spiegelau-craftbeerglasses.com **\$42.99**



EASY FERMENTER AND WEIGHTS STARTER KIT

Once the fermentation bug bites, it easily spreads, which is why homebrewers often find themselves exploring sourdough, cured meats, fermented vegetables, hot sauces, and other DIY food and drink. If you've ever looked at a vegetable and wondered if you can ferment it, the answer is yes, and the solution is right here. The Easy Fermenter and Weights Starter Kit includes everything you need to start fermenting your own sauerkraut, kimchi, pickles, and other homemade goodies. All you need to supply are your own Mason jars and some vegetation for your little Lacto friends to chew on.

nourishedessentials.com
\$37.99



FERMENTOLOGY SAUER STICK

If you've never made sauerkraut before, it's time to try. The recipe is incredibly simple, and homemade kraut is much better than anything you can buy in the store. The hardest part is getting all that salted cabbage to stay put so that the whole batch remains uniformly brined. This task is made much easier with the Sauer Stick from Fermentology. Pound away the day's stress by packing down cabbage.

tryfermentology.com
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Whether you're fermenting vegetables or preparing a yeast starter, a good, old-fashioned Mason jar is hard to beat. And while you could, technically, drill a hole in the lid, add a gasket, and pop on a 3-piece airlock, it's much easier to use one of these silicone dry airlocks. BPA free and dishwasher safe, these pressure relief valves let carbon dioxide escape while keeping unwanted oxygen and curious critters out of your precious ferment.

masantops.com

Starting at \$21.95 for a pack of 4



INDEPENDENCE MATTERS BUMPER STICKER

The vast majority of the more than 7,000 breweries in the United States are independent. Show your support for your neighborhood brewpubs and taprooms with an Independence Matters bumper sticker!

supportindependentbeer.com

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FETCH! DOG BOTTLE OPENER

This corkscrew and bottle opener resembles a dog that has dutifully removed the crown cap from its human's bottle of homebrew and eagerly awaits further instruction. It's the perfect gift for anyone who has sent Zymurgy a picture of their brew dog.

kikkerland.com

\$14.99



ALLIE CAT CORKSCREW & BOTTLE OPENER

This corkscrew and bottle opener resembles a cat that is enjoying a good stretch while it contemplates ways to inflict puncture wounds upon its human. It's the perfect gift for anyone who has sent Zymurgy a picture of their brew cat.

truezoodesign.com

\$17.99



SUDSKI SHOWER BEER HOLDER

If you've never had a shower beer, you're missing out on one of life's great pleasures. Lather, rinse, drink, repeat. These waterproof holsters stick to glass, shower tile, marble, and more to keep a can or plastic cup (not suitable for glass or bottles) of beer within reach.

30watt.com

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New & Used

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AustinHomebrew.com

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HOPPED UP COFFEE

Hopped Up Coffee from Old Town Spice Shop in Fort Collins, Colo., takes regular coffee and makes it extraordinary. By infusing coffee with hops, malted barley, and spices, Hopped Up Coffee offers nods to some of your favorite beer styles. Current offerings include Black IPA, Chocolate Stout, Winter Warmer, and Scottish Ale, with seasonal selections rotating in and out. Old Town Spice Shop recommends brewing Hopped Up Coffee in a French Press to maximize flavor extraction. We're curious about using it to brew coffee beer.

oldtownspiceshop.com

\$12.00

HOLY GRAIL HAT

If you're known to stand in line for hours seeking an elusive white whale, rarest of the rare, the holy grail of craft beers, this hat was made just for you! Flip-up buckram and a 5 mm rope give this cap a unique look that's sure to turn heads at festivals and on brew day. This nylon hat features a flip-up stay pinch, flex visor, cotton sweatband, and adjustable snapback.

HomebrewersAssociation.org

[look for SHOP]

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eGRANDSTAND.COM/uglysweater

GRANDSTAND

First Annual Farmhand Brewing Company Homebrew Competition

By Amahl Turczyn

Brett Bengford opened Farmhand Brewing Company in Earling, Iowa, earlier this year after six years as an avid homebrewer. "My friend Jay and I started brewing together and got instantly hooked," he remembers. "We went from extract to grain within a year and from bottling to kegging within a few batches."

Like so many other homebrewers, Bengford's passion for brewing soon prompted him to go pro. "Earlier this year I purchased a foreclosed bar in a town of about 400 people. From there, without much hesitation, I put the plans together to open a nanobrewery."

Location is critical to any business plan, and in the tiny town of Earling, Bengford was well aware of the potential challenges awaiting him.

"This area is small and rural, and like many memes on the internet imply, yes, this is Busch Light territory. In an effort to push people's taste buds and beer interests, what better way than to showcase what homebrewers are doing in their backyards and across the country?"

There are still a few legal matters to attend to, but Farmhand Brewing Company's doors are officially open for business. "We are still waiting on our brewer's notice, but we've opened and are selling local beers from Iowa and Nebraska along with craft distilled spirits."

The next task for the new business, naturally, was to host a homebrew competition. With the same fearless drive that had led him to open his brewery, Bengford took on the role of organizer for the fledgling event.

"Keeping it simple, we left the competition open to all styles, hoping for as many entries as possible. With the great support of local judges, we implemented a two-judge-per-entry format, with a three-judge best-of-show panel. Allowing non-certified judges to sit with certified judges gave the newer ones some insight into understanding the beers."

Without a whole lot of time to plan the event, some aspects, like partnering with local charities for fundraising and community support, will have to wait until the next competition. "This year some of our charitable involvement was limited by the short timeframe of planning and overall turnout, but we do look to partner with our local volunteer fire department next year."

Chris Proulx (left), Tom Mendick (right)





Sanctioning the event with the AHA and BJCP was not overlooked, however, and Bengford is grateful for the guidance he received.

"We are thankful to the AHA for their support with the care package they sent—it was put to good use. We are looking to expand support and sponsors for next year, and growing the event." Prizes were fairly straightforward this year, but that's another area that will undergo improvement during the next event. "Our winners received a medal and a ribbon for the top three BOS positions."

Finding a venue for the competition was not a problem. "We held our event at our brewpub," Bengford said. "Our bar and grill provided great burgers and gigantic tenderloin sandwiches." Keeping judges well fed at the first annual event means they will be back next year.

Best-of-show winner Tom Mendick won top honors at the competition with an apple mead, or cyser, the recipe for which he was generous enough to share with *Zymurgy* readers. When asked how he got into homebrewing, he admits he was reluctant at first.

"I've always been a craft beer person but never thought I had the patience to wait until the beer was ready." He changed his mind when he got a chance to brew with some family members, however.

"About seven years ago I was the assistant brewer on a Brewers Best kit. Once I saw the full brewing process and remembered I could have multiple batches in progress at the same time, I was in."

One brewer in particular stands out as a big influence on Mendick's homebrew education, along with his local club members. "My first brewing inspiration would have to be my uncle, Bern Mendick, who introduced me to brewing with that Brewers Best kit. There are a ton of great brewers in my homebrew club, Homebrewers Local 402, whom I have learned so much from over the years."

Other craft brew luminaries also provide new ideas for Mendick's brewing directions.

Brew
This!

Buzzed Cyser

Tom Mendick, Best of Show, First Farmhand Brewing Company Homebrew Competition

Batch Volume: 5 US gallons [18.9 L]

Original Gravity: 1.058 [14.3°P]

Final Gravity: 1.002 [0.5°P]

Alcohol: 6.3% by volume

FERMENTABLES

5 gal. (18.9 L) Kirkland apple juice

1 lb. (454 g) watermelon blossom honey

OTHER INGREDIENTS

1 tsp. Wyeast Yeast Nutrient (half at pitching and half 2 days into fermentation)

YEAST

White Labs WLP 775 English Cider Yeast

BREWING NOTES

Ferment at 65°F (18°C) for 4 days, then let free rise until fermentation is complete.



"Since I like to make more unique beers, I look up to guys like Drew Beechum and Sam Calagione, who balance adjuncts and strange ingredients with a base beer to make something fun, but still manage to retain elements of the base style."

Mendick gravitates towards creative, lower-alcohol, fast-moving styles so he can brew more often. "I like to make beers that I can't get everywhere," he explains. "I have a reputation for making adjunct beers. It makes brewing more fun to me. I enjoy the challenge of balancing new flavors with base beers. I tend to stick to 5 to 6 percent, light color, lower-bitterness beers. I have six taps at home, so a Russian imperial stout, for example, would be on tap for quite a while, and reduce how often I 'need to' brew."

That he once thought himself too impatient for the brewing process has now taught him the importance of giving his beers all the time they need to finish out completely. His recommendations for new brewers? "Temperature control, proper pitch rates, and fresh ingredients are key. Be patient, don't try to rush the fermentation. Practice, practice, practice."

For future brewing goals, he's got his competition sights set high. "I had one beer go to the NHC finals a few years ago. I really want to get a medal at the biggest competition of the year."

Amahl Turczyn is associate editor of Zymurgy.

“
**Be patient,
don’t try
to rush the
fermentation.
Practice,
practice,
practice.**

— Best-of-show winner Tom Mendick



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Sanctioned Competition Program

MAY 2019

Grafton Brewing Competition, 91 entries
Allen Liam, Salisbury, Queensland, Australia

JUNE 2019

Polish Homebrewers Championship 2019/
Mistrzostwa Polski Piwowarów Domowych
2019, 625 entries
Piotr Kalenczuk

LBC Wort Share Brew Fest, 30 entries
Clark Heidelbaugh, Burke, VA

ASH HOBY Wheat Mini-Comp, 25 entries
Brad Harris, Phoenix, AZ

Sonoma Marin Fair Homebrew Competition,
18 entries
Damien Jones, Petaluma, CA

2019 IPA Beach Slap, 55 entries
Juseok Lee, Busan, South Korea

Dekegger Home Brew Competition, 30 entries
Jon Stough, Angola, IN

FDMBA 1V, 55 entries
Ian Cosier, Chamonix, France

Desafio Corina 2019 #2, 7 entries
Gustavo Henrique Braga, Brasília, Brazil

MCM Homebrewer of the Year Q2, 8 entries
Justin Hall, Belleville, MI

IV Copa Peruana de Cervezas, 200 entries
Yann Lemaire & Jorge Jimenez, Lima, Peru

Hogtoberfest: Homebrew Competition,
86 entries
Sean Etters, Altoona, PA

CANarchy Cup, 21 entries
Jeremiah & Yaneli Rivera, Santa Ana, CA

Blazing Paddles, 108 entries
Iain Robertson, Toronto, ON

2nd Annual David BA Goliath,
27 entries
Kevin Bergeron, New Orleans, LA

QUAFF COC - Pale German Lager - Bitter v.
Malty, 6 entries
Eli Palma

Rumble in the Jungle Series No.1, 83 entries
Sebastian Lohmann, Cologne, Germany

World Cup of Beer, 350 entries

Tim Murray, Walnut Creek, CA

California Mid-State Fair Homebrew Competition, 89 entries

Joe Richards, Grover Beach, CA

Linn County Fair Home Brew Competition, 35 entries

Charles Packard, Iowa City, IA

1º Concurso Cervejistas, 14 entries

Saulo Vieira, Americana, São Paulo, Brazil

Aurora Brewing Challenge, 583 entries

Clayton Hoy with Mike Vandervoort, Toronto, ON

JULY 2019

Texas Farmers Market Homebrew Competition, 7 entries

Price Winton, Austin, TX

Marin County Fair 2019 Amateur Homebrewing Competition, 138 entries

Rick Story, Novato, CA

O Maior Concurso de IPAs Caseiras do Mundo, 41 entries

Marcos Luís Nart, Caxias do Sul, Brazil

Brisbane Amateur Beer Brewers Annual Championship, 89 entries

Daniel Neuhausen

Concurso Cervejeiro Caseiro Cerveja Blumenau Edição 2019, 48 entries

Vicente Luiz Reinecke Koch, Blumenau, Brazil

III Concurso Acerva Catalão, 17 entries

Thiago Elias, Catalão, Brazil

Western Brewers Conference - Rye IPA, 18 entries

John McConnell, Auckland, New Zealand

SA Brew Club Winter Competition, 74 entries

Nick McAuley, Adelaide, Australia

Contest 2019 Homebrewer BIRRAGUSTANDO, 12 entries

Laboratorio Roheroes (Alberto Trucco), Montà, Italy

El Paso County Fair Homebrew, 47 entries

John Roberts, Colorado Springs, CO

Red River Valley Fair Home Brew Competition, 12 entries

Andrew Kjos, Ankeny, IA

Hogtown 2019 Belgian Intraclub, 6 entries

Kevin True

7º Festival de Confrarias de Cervejeiros

Caseiros do Rio De Janeiro, 54 entries

Cervejeiros Caseiros da Barra da Tijuca e Recreio dos Bandeirantes, Rio de Janeiro, Brazil

Vale do Lupulo BrewShop - Cervejeiro Destaque Julho/2019, 18 entries

Daniel Ropelato, Blumenau, Brazil

Primeiro Páreo Boot Boller de Cerveja Caseira, 86 entries

Ricardo Greganini Cruz, Umuarama, Brazil

2019 Ohio Brew Week Homebrew Competition, 249 entries

Jim Satin, Saline, MI

Indiana Brewers' Cup, 1502 entries

Andrew Weaver, Wood River, IL

SBL Mid-Summer COC, 15 entries

Vince Becker, Savannah, GA

Red, White, and Brews, 93 entries

Todd Slater & Matt Castellino, Thousand Oaks, CA

Michigan State Fair Homebrew Competition, 218 entries

Adam Cagle, Kalamazoo, MI

North Dakota State Fair, 2 entries

Bob Rakness, Minot, ND

Waukesha County Fair Amateur Beer Exhibition, 29 entries

Rob DeRosia, Wauwatosa, WI

Homebrewers Guild of Beer Sheva - Summer Challenge, 56 entries

Maksim Shain, Beer Sheva, Israel

Copa San Arnulfo 2019, 25 entries

Abad Lira Conde, Tlaxcala, Mexico

Mexicali Home Brewers Hop Wars, 51 entries

Esdras Valdez, Mexicali, Mexico

Delaware State Fair Home Brew Competition, 80 entries

Don Lewis, Dover, DE

Deer River BBQ & Brew Fest, 77 entries

Bob McIntyre, Deer River, MN

The Niagara College Brewing Competition,
161 entries
Brian Marmoreo

2019 US Open, 435 entries
Jamey Barlow, Charlotte, NC

Last Brewer Standing 2019: The Secondary,
16 entries
John DiSpirito, East Meadow, NY

10th Annual Michigan Beer Cup 2019, 443 entries
Konrad Schlenner, Lake Orion, MI

Concurso Pomerode Brauer Geschäft 2019,
32 entries
Gatão Alfonso Reu Neto, Pomerode, Brazil

Lane County Fair, 35 entries
Brian McBeth, Salem, OR

QUAFF COC - American v. German Wheat Beer,
8 entries
Ryan Fowler

SNAFU's SCC: German Wheat Beers, 12 entries
Holly Mulder, Charlotte, NC

Ventura County Fair, 45 entries
April Sinsley, Riverside, CA

Arapahoe County Homebrew Competition,
168 entries
Mark Pennick, Denver, CO

2º Concorso "Homebrewers Gorizia X The
Lure," 41 entries
Giovanni Messineo & Alessandro Baron, Gorizia, Italy

VIII Concurso Estadual da ACervA Catarinense,
500 entries
Silvio Rode, Rio do Sul, Brazil

8th Annual Merrimack Valley Home Brew
Competition, 239 entries
Dave Williams, Boston, MA

2nd Annual Arizona Mead and Cider Festival
Homebrew Competition, 64 entries
Tim Wildenhain, Florence, AZ

For What It's Wort, 166 entries
Mark Ingold, New Palestine, IN

NJ State Fair Homebrew Competition,
332 entries
Brandon Shaughnessy, NJ

Brew Wild, 66 entries
Cohan Drew, New South Wales, Australia

Iowa State Fair, 278 entries
Aaron Reif, Pleasant Hill, IA

ASH HBOY Light Beer Minicomp, 10 entries
Mike Bush & Danielle Schanke, Chandler, AZ

AUGUST 2019

2019 Best of the Bay, 285 entries
John Hocking, Tacoma, WA

Redstick Brewmasters Clash of the Carboys
2019, 50 entries
Joe Thibodeaux, Baton Rouge, LA

3rd M.A.S.H. In Competition, 110 entries
Josh Aune, St. Louis, MO

Howard County Fair Homebrew Competition,
34 entries
Chad Schreiner, Highland, MD

Dakota County Fair, 80 entries
Andrew Gehrke, Burnsville, MN

Kentucky State Fair Homebrew Competition,
300 entries
Alex Rezmerski, Louisville, KY

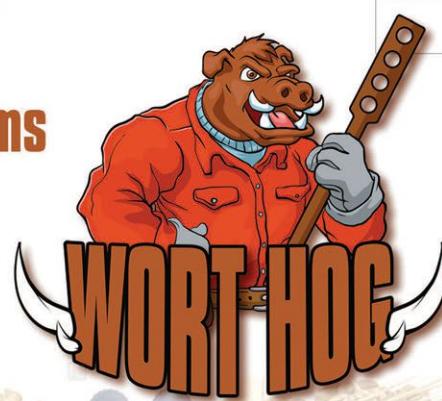


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SECURE

Western Idaho Fair Homebrew Competition,

123 entries

Thomas Byrne, Arthur Widmar & Joseph Kinney,

Star, ID

16th Annual Austin Zealots Inquisition,

309 entries

David Rogers, Cypress, TX

2019 Los Angeles County Fair Homebrew

Competition, 204 entries

Jeff Koehler, Pasadena, CA

Fire Fighters' Chili Cook-Off & Homebrew

Competition, 76 entries

Cliff Sullivan, Santa Cruz, CA

Evergreen State Fair 2019, 421 entries

Cory Geerds, Bellingham, WA

1º Concurso Epório Buggio Bier, 16 entries

Rodrigo Waldrich, Timbó, Brazil

RIBS August Club Competition, 23 entries

Adam Carroll, West Greenwich, RI

I Concurso de Cerveja Artesanal, 24 entries

Flávio Luis da Silva Alves, Paraiso do Tocantins, Brazil

2019 Minnesota State Fair Homebrew

Competition, 623 entries

Travis Lott, Maple Grove, MN

Manitowoc County Fair Blue Ribbon Brew

Competition, 87 entries

Caleb Meinke, Madison, WI

Beer & Sweat, 216 entries

William Crothers, Jr., Newark, OH

Malt Madness XIII, 361 entries

Nick Shadel, Reading, PA

RBT Annual Brew Comp, 29 entries

Scott Eckford

WCB Dark and Strong, 28 entries

Neville Scott

Gawler Agricultural, Horticultural & Floricultural Society Show 2019 - Home Brewed Beer Section, 40 entries

Greg Wieder, Redwood Park, Australia

Concurso Cervejeiro Caseiro 2019 - Giffa Imperial Cervejaria, 58 entries

Leonardo Zorzi, Jundiaí, Brazil

5º Concurso Nacional de Cervezas Artesanales del Paraguay, 142 entries

Jose Duarte, Asunción, Paraguay

2019 Maryland State Fair Homebrew Competition, 102 entries

Sean Timm, Annapolis, MD

Farmhand Brewing - Home Brew Competition, 41 entries

Tom Mendick, Omaha, NE

Limbo Challenge - How Low Can You Go!, 247 entries

David Rogers, Cypress, TX

3rd & Ferry Fish Market Clam Jam Seafood Festival, 10 entries

Scott Smith, Macungie, PA

Concurso Paranaense de Cervejas Caseiras - Etapa Maringá, 104 entries

Flávio Henrique Zanin Meneguetti, Maringá, Brazil

SEPTEMBER 2019

Brewing - Mevashlim 2019, 104 entries

Nitai Leffler, Kibbutz Ein Hashlosha, Israel

Albion Area Fair, 21 entries

Darrel Taylor, Cambridge Springs, PA

7th Annual Picnique Belga, 41 entries

Jeremiah Baer, Collinsville, IL

Great Frederick Fair Homebrew Competition, 81 entries

Ted Bybel, Middletown, MD

The image shows three books by Charlie Papazian. On the left is 'The Homebrewer's Bible: The Complete Joy of Homebrewing' (Fourth Edition), which is described as 'FULLY REVISED AND UPDATED'. In the center is 'The Home Brewer's Companion: The Complete Joy of Homebrewing Master's Edition' (Second Edition), also 'FULLY REVISED AND UPDATED'. On the right is 'Microbrewed Adventures: A Spirited Journey to the Heart and Flavor of the World's Great Craft Beers', which features a compass rose design and is described as having 'More than 50 homebrew recipes'.

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The image shows the front cover of the book "SIMPLE HOMEBREWING" by Drew Beechum & Denny Conn. The cover features a yellow background with illustrations of a beer bottle, a glass of beer, hops, and grains. Two circular inset photos show a smiling man with glasses and a beard, and another man with a mustache and a surprised expression. A large orange speech bubble contains the text "LESS WORK, MORE FUN" and a bulleted list: "• Expert advice for brewers of all levels", "• Time-saving techniques", and "• 40 recipes". Another orange speech bubble says "NOW AVAILABLE -IN- PAPERBACK & EBOOK". The Brewers Publications logo, featuring a stylized letter "B" inside an orange circle, is at the bottom right, along with the website "BrewersPublications.com".

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October

CAN SEAMERS



The Gift That Literally Keeps On Giving



This installment of Commercial Calibration features two classic German beer styles, one a cool-fermented red ale and the other a hoppy, unfiltered lager.

Alt is the German word for “old,” and *altbier* refers to the older style of ale brewing in Germany, as opposed to the newer process of lager fermentation. *Altbier* is said to have come from the country’s Westphalia region, near the town of Düsseldorf. As with Kôlsch yeast, *altbier* yeast evolved to favor cooler fermentations, meaning these ales tended to be →

Judges' Score LITTLE RED CAP

Grimm Brothers Brewhouse, Loveland, Colo.

BICP Category 7B Altbier



DAVE HOUSEMAN



SANDY COCKERHAM

→ smoother, cleaner, and maltier than ales of other countries.

Grimm Brothers Brewhouse pays homage to this historically important style with its Little Red Cap Düsseldorf-style altbier. Grimm's brewers give it an American spin with Cascade hops but maintain the cooler fermentation process. Little Red Cap won gold medals at the 2011 and 2016 Great American Beer Festivals (GABF), bronze at the 2012 GABF, and silver at the 2016 World Beer Cup. It is 5.4% ABV with 29 IBUs.

Port City Brewing started its Lager Series in 2016 to explore unique lager styles, one of which is Franconian kellerbier. Northern Bavaria is famous for rauchbier (smoked beer), but *keller* (meaning cellar) is another favorite of the region. It is usually served in the zwickel style, meaning straight from the tank: this also means it's unfiltered, so the flavors of hops, yeast, and malt are often more pronounced than they are in a finished, filtered lager.

Kellerbier is also naturally carbonated, or *ungespundet*: sealing the tank just before fermentation is complete creates just the right amount of carbonation. The regional designation also means it is hoppier than most keller styles, with a light, reddish-amber color that places it somewhere between helles and Vienna lager.

Franconian Kellerbier is one of Port City's draft-only releases, but the brewery was kind enough to send some crowlers of this delicious lager to our judges. It is 5% ABV, with 35 IBUs of gently spicy Spalter hops.

AROMA

This beer starts with a complex maltiness that focuses on a nutty, chocolate malt presence without crystal or caramel notes. There is good deal of pear-like fermentation fruitiness and very low hop aroma. Light alcohol is noticeable. No DMS or diacetyl. **10/12**

APPEARANCE

Brown/amber color is appropriate to style. Clear with a bit of light haze. The head is rocky and beige, with good retention. Canned example is a little under-carbonated. **3/3**

FLAVOR

Malty up front, with a nutty, chocolaty character. Assertively bitter with low hop flavor. Balanced malt sweetness and hop bitterness for the style, leaning toward the hop bitterness that is dominant in the aftertaste. Fruity fermentation esters are moderate to high and reminiscent of pears. No DMS. A low level of diacetyl is just barely above the flavor threshold. No overt alcohol. **16/20**

MOUTHFEEL

Medium bodied with a smooth, slightly silky mouthfeel that is short of creamy. Fairly well attenuated but not quite a crisp, layered example. Lingering bitterness in mouthfeel. Low but noticeable alcohol warming. **4/5**

OVERALL IMPRESSION

Quite true to the altbier style as an assertively bitter yet malty ale. Focus on chocolate malt is a little heavy handed; Munich malt, with or without a decoction, would retain maltiness without overly focusing on chocolate malt. Fruitiness is somewhat high; the beer could have been fermented cooler and lagered longer to cut back on the esters and reduce diacetyl. Pitching more yeast at lager rates would also help reduce the esters. Still quite drinkable and enjoyable with sausages, cheeses, pretzels, and other bar food. **8/10**

TOTAL SCORE 41/50

AROMA

This beer has moderate-plus malt aroma of bread and bread crust, with lighter notes of toast and grain. Low earthy and slightly herbal hop aromas linger quite pleasantly as the beer warms. No esters detected, but there is a low, sweet alcohol aroma. **10/12**

APPEARANCE

Pours with a medium-high ivory head with texture that isn't quite rocky. Retention is above average. Beer color is a deep copper color and clarity is good, but not quite brilliant. **3/3**

FLAVOR

Malt is not quite medium high with a combination of grain, bread, a low note of cocoa, some toast, and a trace bit of bread crust. Bitterness is medium high with a grassy character. Medium-low spicy alcohol flavor and not much ester fruitiness. Hop flavor is moderate, herbal, and earthy. A very slight note of oxidation. **15/20**

MOUTHFEEL

Body is just below medium full. Medium-high carbonation. Alcohol warmth is a little less than medium intensity. A low grassy, astringent character lingers and, coupled with the alcohol warming, makes this finish out just a little bit rough. **3/5**

OVERALL IMPRESSION

This is an enjoyable altbier with hop bitterness at the higher end of the style range, more in the vein of Zum Uerige. I think the malt could use a little more depth. This is fairly well attenuated but has a coarse ending in both flavor and mouthfeel. Still, quite enjoyable to drink. **7/10**

TOTAL SCORE 38/50



Judges' Score

FRANCONIAN KELLERBIER

Port City Brewing Co., Alexandria, Va.

BJCP Category 7C Kellerbier



SCOTT BICKHAM



GORDON STRONG

AROMA

First impression is moderate husky-grainy notes and medium-low fruitiness with notes of pear and green apple (acetaldehyde at an acceptable level for the style). The hop level is moderately high, with herbal and spicy notes, along with a little pipe tobacco. **9/12**

APPEARANCE

Amber with good clarity. Light haze is more common in the draught zwickel versions of this style. The head is white with moderate thickness, uniform beading, and good persistence. **3/3**

FLAVOR

Very hop forward, with medium-high herbal, spicy, and woody notes representative of German noble hops. I would consider it over-hopped if the base style were helles, but Franconian versions diverge a little in the hoppy direction. The malt character is round and pleasant, with biscuit and grainy notes. The finish is medium-dry, leaning more toward Pils than helles. The medium hop bitterness lingers and is accented by mineral notes. **16/20**

MOUTHFEEL

Medium body, carbonation, and creaminess—all appropriate for style, as is a low alcohol warmth. The only detraction is a little astringency that leaves a slight chalky sensation on the back of the tongue. **4/5**

OVERALL IMPRESSION

This beer is very well done as a hop-forward lager, but the keller characteristics are not very obvious, with the exception of slightly elevated levels of fruity esters and acetaldehyde in the aroma. The hop character is more pronounced than the Munich Helles base style noted in the BJCP Guidelines, but as noted above, some Franconian examples tend to be tilted more towards the hops. All in all, it is an interesting and pleasant beer, and I commend you on making this well-crafted lager available to the US market. **7/10**

TOTAL SCORE 39/50



JUDGING

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

OUR EXPERT PANEL

Includes Dave Houseman, a Grand Master VII level judge and competition director for the BJCP from Chester Springs, Pa.; Sandy Cockerham, a Grand Master VI level judge from Indianapolis, Ind. and an associate exam director and Midwest Representative for the BJCP; Scott Bickham, a Grand Master IV 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 XIII judge, principal author of the BJCP Style Guidelines, and president of the BJCP board who lives in Beavercreek, Ohio.



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ON THE WEB

Grimm Brothers Brewhouse
grimbrosbrewhouse.com

Port City Brewing
portcitybrewing.com

BJCP Style Guidelines
bjcp.org

Illustrations by Terry McNerney

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Hope and Beer



Taopiphop Limjitrakorn

By Brian Bartusch

“I'm at a city planning meeting and it's going a bit late, I'm sorry. I'll be there as soon as possible!"

It's no surprise Taopiphop Limjitrakorn, or Tao the ex-outlaw brewer, is late. I think he's been late every time we've met, but this time he's got a good reason.

Tao, who has once before been in the pages of *Zymurgy* in Alex Gearhart's "Fringe Brewing in Thailand" (May/June 2018), has put aside his clandestine brewing to follow a higher calling.

"I used to be a lawyer, and I was working for a big conglomerate. I had to help them

collect on loans and mortgages from regular people and sometimes it was heartbreaking. I remember once a man came to court to argue against foreclosure on his land. He had no shoes; he walked into court barefoot. He was asked to take an oath, but he replied that he couldn't agree to the terms because he couldn't read the documents."

Tao lowers his head and takes a long sip from his beer, momentarily lost in the memory.

"I realized I couldn't work like that anymore. I wanted to help underprivileged people, not help the big corporations that were unfairly taking advantage of them."

This desire to help his countrymen brought Tao together with a diverse group of like-minded colleagues to found the Future Forward party.

Thailand has been struggling through a decade-long crisis of military rule and a lack of true democracy. The Future Forward party aims to inspire the Thai people to embrace democracy and show that an alternative political model is possible. They are offering hope for transparent politics, a return to democracy, free and fair elections, and a commitment to rebuilding political consensus.

"I think the situation with beer brewing here is symbolic of the injustice happening

Brew
This!



Future Forward Sour Saison

Recipe courtesy Taopiphop Limjittrakorn

Future Forward Sour Saison is a mixed-fermentation fruit beer inspired by my political engagement to a local Sato brewer in northeastern part of Thailand. Sato is a traditional sticky rice beer using a local yeast ball called Look Pang, which contains mold, mysterious yeast strains, and *Lactobacillus*, all of which give a nice fruity sour character to the brew.

Due to the hot climate of Thailand, this brew is designed for a high fermentation temperature using mixed yeast strains, saison yeast, and a Sato yeast ball. I also used lychee fruit from the northern hill tribes of Thailand. This recipe embraces the lost art of traditional Thai brewing.

I consider brewing to be an ancient human right. People should be able to make their own beer and bring happiness to share with their community. I am working on the laws here and looking forward to a future in which craft beer can be brewed in Thailand and later exported to the world.

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.044 (11°P)

Final gravity: 1.005 (1.3°P)

Color: 3–4 SRM

Bitterness: 20 IBU

Alcohol: 5% by volume

MALTS & ADJUNCTS

2.5 lb. (1.13 kg) 2-row pale malt

2 lb. (907 g) flaked wheat

0.25 lb. (113 g) acidulated malt

1 lb. (454 g) sticky rice*

1.5 lb. (680 g) extra light dried malt extract

ADDITIONAL ITEMS

2 lb. (907 g) lychee, blended

HOPS

1 oz. (28 g) Mosaic, hop stand

1 oz. (28 g) Citra, hop stand

0.5 oz. (14 g) Simcoe, dry hop

0.5 oz. (14 g) Mosaic, dry hop

0.5 oz. (14 g) Citra, dry hop

YEAST

Lallemand Belle Saison

Sato yeast ball

BREWING NOTES

To prepare sticky rice:

1. Soak the sticky rice overnight.
2. Steam rice until cooked, about 15 minutes, then rinse with cool water until rice is cool and no longer sticky.

Mash grains and steamed sticky rice in 8 qt. (7.6 L) of water at 150°F (65.6°C). Collect the wort, top up with water to make 5 gal. (18.9 L), and bring to a boil. Top up to 6 gal. (22.7 L). Turn the heat off, add the malt extract and stir to completely dissolve.

Return the wort to the heat and boil 60 minutes. Turn the heat off and allow to cool with the lid off until wort reaches 180°F (82.2°C). Add hops and blended lychee, and let steep 20–30 minutes before fully chilling. Transfer chilled wort to fermenter, aerate, and pitch the saison yeast and Sato yeast ball.

Ferment at 73°F (22.8°C) for about two weeks. Add dry hops 7 days before bottling or kegging.

* Sticky rice is also known as glutinous rice and can be purchased at any Asian market. Rice yeast balls are more difficult to find but can be ordered online from Amazon and eBay; search for "Chinese dried yeast balls."

“

A political
miracle has
happened!

in this country. We've had big money control the markets and influence the government from the beginning. We need to bring power back to the people, and beer can help do this. I want to see the brewing laws change—people should be allowed to homebrew and potentially grow their brand into a business, just like in most countries around the world.”

For Tao, beer has been a catalyst throughout his campaign, from his initial notoriety as an outlaw brewer to his campaign style that often meant sharing a pint with his constituents.

“My campaign was completely grassroots, going door to door. I just went out riding my bicycle and meeting people, having a chat and sometimes a beer with them at the small shops in our area. I learned that they just wanted someone to listen to them and really try to understand the issues and policies that were affecting them. They wanted a representative to actually represent them and not just try to gain more political power for his party.”

Tao's dedication and hands-on approach had unexpected results when he won the district and ousted a 20-year incumbent.

“A political miracle has happened!” he tweeted upon learning of the win.

Tao and I order another beer and settle in to discuss the world's problems. We know it's a long and difficult road ahead, but we have two important ingredients: hope and beer.

Brian Bartusch is a cofounder of beervana.asia, the first craft beer distributor of Southeast Asia. He also occasionally enjoys some underground homebrewing and beer judging around the region.

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Fear of Missing Out

They still make you come to these things?

I got that question more than a few times as I made my way around Homebrew Con in Providence, R.I., in June. It's been three years since I handed over the reins of *Zymurgy* to Dave Carpenter, after all, so I'm no longer part of the American Homebrewers Association staff. But I'm still part of the Brewers Association (BA) staff, serving as editor-in-chief of *The New Brewer*, the BA's magazine for professional craft brewers.

The first two years after I made the decision to solely focus on *The New Brewer* (I served at the helm of both magazines for 10 years), I didn't attend Homebrew Con in either Baltimore or Minneapolis. But I had a nagging feeling that something wasn't quite right. I'm pretty sure I had a bad case of FOMO: Fear of Missing Out.

Perusing the stellar list of seminars that Matt Bolling and the rest of the AHA staff had put together each year made me jealous. There's a wealth of knowledge to be gained at Homebrew Con, no matter what level of brewer you are, amateur or professional. Homebrewers are at the cutting edge of craft brewing. They're risk takers. They're innovative. They're wildly imaginative. They're talented. And exploring what they're thinking about, working on, and tinkering with provides a glimpse of what's coming down the road in professional craft brewing.

Boston Beer's Jim Koch has always said that the line between homebrewers and professional craft brewers is arbitrary and invisible. Koch has freely admitted that he reads every issue of *Zymurgy* for inspiration. In fact, Koch has said that the idea for Infinium, Boston Beer's Champagne-style beer, came about after reading Drew Beechum's article on Champagne beers in the May/June 2006 issue of *Zymurgy*.



(Can I point out that Beechum was brewing brut beers about 12 years before brut IPA became a thing?)

So, last year, I made the trip to Portland for Homebrew Con and all felt right in the world. And this year, I furiously scribbled notes, gained more knowledge, and got more great ideas as I attended myriad seminars, judged in the National Homebrew Competition, and attended the inimitable Club Night in Providence. Here's a small sampling of what I learned and experienced:

- Tried Kentucky common for the first time.
- Realized that pretty much every homebrewer is already brewing with kveik yeast.
- Sampled three different kinds of bochet (mead made with caramelized honey).
- Discovered more about biotransformation and hop creep.
- Found out more about brut IPAs and the challenges of brewing them.

- Heard from Stan Hieronymus about new experimental hops.
 - Learned about NTU: Nephelometric Turbidity Units, which measure the level of haziness in a liquid (such as beer).
 - Discovered more about kombucha and SCOBY hotels.
 - Honed my beer tasting skills with a seminar on Deductive Beer Tasting by Master Cicerone Rich Higgins.
 - And sat through an oddly mesmerizing seminar on alternative yeasts and bacteria that I'd never heard of...only to see a few intrepid homebrewers raise their hands when asked if anyone had already tried brewing with them.
- I rest my case. See you in Nashville.

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



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Not only is Adam a master of his craft, but he has found success without ever losing site of what's important—the same values that serve as the foundation of Wyeast.



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