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Publisher | Brewers Association™

Editor-in-Chief | Dave Carpenter

Technical Editor | Kaylyn Kirkpatrick

Spanish Translation Editor | Pablo Gomez

Art Director | Jason Smith

Marketing Director | Ann Obenchain

ann@brewersassociation.org

Sales Director | Kevin Doidge

kevin@brewersassociation.org

**Business Development Manager
for Advertising & Sponsorship**

(East) | Kevin Doidge

kevin@brewersassociation.org

(West) | Kari Harrington

kari@brewersassociation.org

Sales Activation Manager | Joe Damgaard

Senior Marketing Manager | Rachel Staats

Marketing Manager | Jeb Foster

Operations Manager | Dan Goloback

AMERICAN HOMEBREWERS ASSOCIATION

Vice President | Ryan Farrell

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My New Normal

En after we have graduated from COVID-19 restrictions and returned to something resembling normal life, I plan to maintain a few new habits in service of public health and self-preservation.

Handshakes, for example, shall be left permanently in the past. Henceforth, it's strictly bowing, nodding, or waving for me—possibly a royal wave if I'm feeling particularly extravagant. From now on, I'm always going to keep a mask within reach, in addition to a travel-sized dispenser of hand sanitizer, a pen and pencil for my exclusive use, and a modest, break-seal-in-case-of-emergency flask of sour mash whiskey. And I'm going to buy new socks before the old ones begin to develop holes, which has nothing to do with health and safety but seems like a responsible, grown-up thing to do.

Unfortunately, "normal," while within sight, still lies some months away, which is why the AHA recently made the difficult decision to make Homebrew Con a virtual event for the second year in a row. The speed of vaccination is increasing admirably, and we all *really* want to go to San Diego, but we simply couldn't justify asking staff and attendees to commit to a large, in-person gathering that may or may not be allowed when the time arrives. There are reasons to be hopeful about the relaxation of public health restrictions, but we're not quite there yet.

So, Homebrew Con 2021 will take place virtually June 17–19. If you attended last year's online Homebrew Con, you already know that despite the distributed, digital format, videoconferenced Homebrew Con is a great deal of fun and offers certain charms that are unique to the online experience.

I, for example, enjoyed the opportunities to interact more directly with attendees in the side chats during educational sessions, something that's considerably harder to do in a capacious convention center ballroom.

I also loved the "ask and upvote" model of posing questions to speakers, which I thought was much more egalitarian and efficient than the old line-up-behind-the-mic method. And, perhaps best of all, you're not limited to whatever sample size the local alcohol control board has deemed appropriate. I prefer my helles by the half liter, thank you very much.

I wholeheartedly encourage you to attend Homebrew Con 2021, and not just because my colleagues and I organize and host it and we're proud of all our hard work. Here's a short list of reasons you should consider joining us.

1. **It's convenient.** This may be the last time you can attend Homebrew Con while you work from home—or, for that matter, while you work from work. In normal years, you'd need to take time off, book a hotel, and, unless you lived in the host city, fly, drive, or kayak to the site. With an online event, you can phone it in for a monotonous meeting about KPIs in one window and engross yourself in a riveting roundtable on IBUs in another.
2. **It's sanitary.** We are working with our digital content hosts to ensure that all Homebrew Con 2021 electrons are thoroughly disinfected en route from their servers to your device.
3. **It's private (if you want).** Introverts, rejoice! With an online event, you can stay home and reap all the intellectual benefits of Homebrew Con without experiencing social overload. Remain anonymous if you like. Chat with fellow attendees as little or as much as you desire. Stay in your jammies

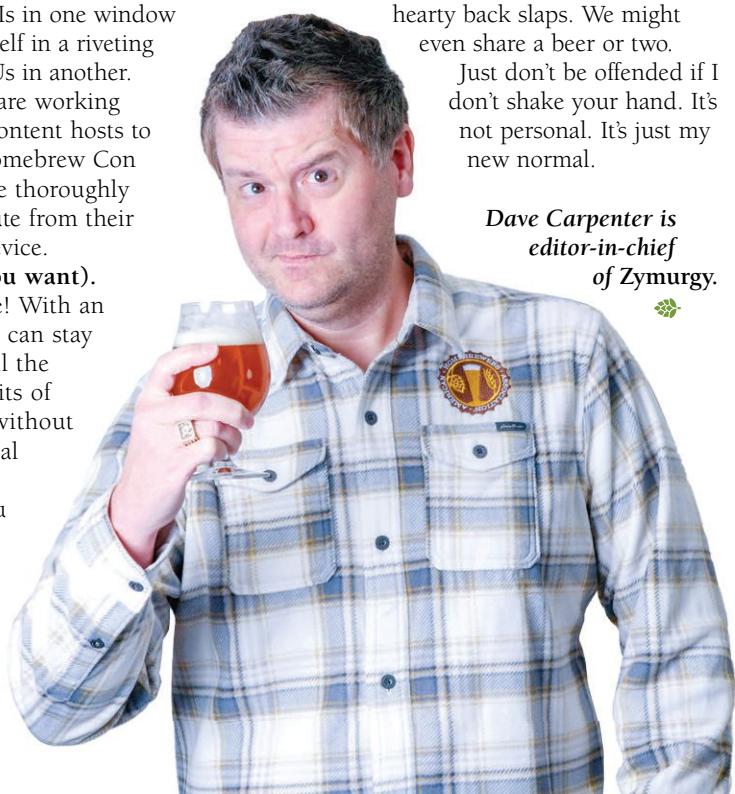
with a cat in your lap. Normally that only happens in certain booths at Club Night.

4. **You don't have to wear a mask.** Had we even been permitted to host a large, in-person event in San Diego, it's almost certain we all would have had to wear masks. Masks remain one of our most effective preventive measures against virus transmission, but I'm as tired of wearing them as you are. They get between my beer and my mouth, and that's just plain rude.
5. **You don't have to be afraid I will spill beer on you.** If you attended Homebrew Con 2019 in Providence, there's a nonzero chance this happened to you.
6. **There's no crop dusting.** If there is, you've only yourself to blame.

Join us, won't you? With any luck, we'll be face-to-face again in 2022, and we can recall fond memories of virtual Homebrew Cons past with healthy chuckles and hearty back slaps. We might even share a beer or two.

Just don't be offended if I don't shake your hand. It's not personal. It's just my new normal.

Dave Carpenter is editor-in-chief of Zymurgy.



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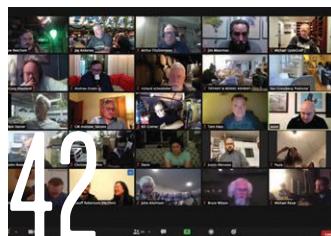


34

IT MIGHT BE A SCHWARZBIER

Off flavors are myriad, running the gamut from ash to cabbage by way of cardboard, plastic, elastic, and more. Their number is legion, but all homebrewers should be familiar with the basic six: acetaldehyde, diacetyl, phenol, dimethyl sulfide, oxidation, and skunk.

By J. K. Bywaters



42

TURNING THE LOCKDOWN INTO EPIC LEARNING HAPPY HOURS

Since the start of COVID-19 restrictions, the Maltose Falcons have gathered online each week to explore the wide variety of craft beers found in Southern California and lend much-needed financial support to the best of L.A.'s sales-starved craft breweries.

By Jay Ankeney



50

RETURN ON INVESTMENT FOR THE HOMEBREWER

In business, it's common to speak of financial return on investment: maximizing return on a given expenditure. Homebrewers can maximize value and intrinsic factors by addressing the return on investment from cost, quality, and holistic perspectives.

By J.B. Zorn



60

THE LOST HEALTHY BEERS OF BELGIUM

Drinking too much beer at once is not healthy, but as recently as the early 20th century, beer was considered a healthy alternative to gin. Some Belgian towns even built reputations on purported health benefits of the local brew.

By Roel Mulder



66

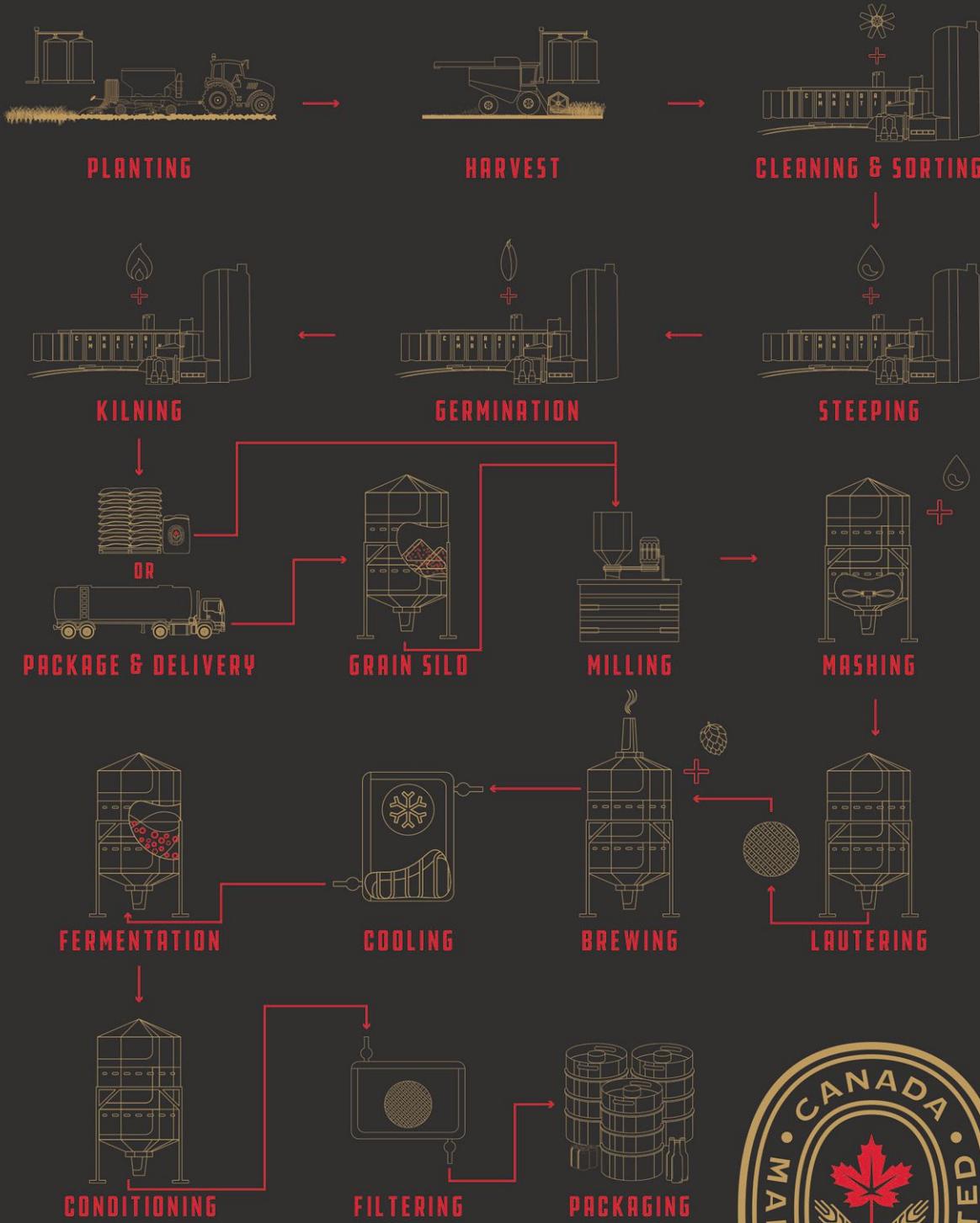
WOULD YOU DRINK MY SPIT?

Believe it or not, the process of brewing manioc root chicha is remarkably sterile, eliminating both human pathogens and the natural toxins in the root itself. This is an ancient tradition, fine-tuned over millennia by the native peoples of the Amazon and Caribbean. Chew, spit, repeat.

By David Schmidt

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Columns

3



EDITOR'S DESK

My New Normal

By Dave Carpenter

88



LAST DROP

Prickly Pear Mead:
A Homebrewer's Foraging Odyssey

By Ralph Bucca

Departments

21



27



Cover Photo
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Vol 44 • No. 3
May/June 2021

8

NOW ON TAP

15

DEAR ZYMURGY

21

YOU CAN FERMENT THAT!

27

BEER SCHOOL

76

BIG BREW GEAR GUIDE

80

RELAX, DON'T WORRY, HAVE A HOMEBREW!

83

FERMENT ON THIS

87

ADVERTISER INDEX



Star Gazer Hazy Double IPA.....	11
Janet's Brown Ale.....	12
Beet Kvass.....	22
Old 755.....	29
SMaSH Sensory Blonde Ale.....	30
Rundown Irish Red.....	32
Em Day's Pale Ale.....	48
Charismatic MangoFauna.....	53
Oceania & Homegrown IPA	55
Rye Edition: Any Porter in a Storm	56
Uitzet, 1851.....	62
Double Diest, 1851.....	63
Brown Diest, 1879	64
Amazonian Chicha.....	71
Summer Wheat.....	85



ON THE WEB

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and more on our website @
[HomebrewersAssociation.org/
homebrew-recipes](https://HomebrewersAssociation.org/homebrew-recipes)

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of fermentation, as in brewing.



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GRAINFATHER CONICAL FERMENTER PRO

Does your fermenter need to have WiFi? Not necessarily. But is a wireless-enabled fermenter incredibly cool and useful? You betcha.

Constructed from 304 stainless steel, the Grainfather Conical Fermenter Pro has an 8-gallon (30-liter) capacity, making it just the right size for 5-gallon or 20-liter batches, with plenty of headspace for kräusen.

A 1.5" tri-clamp ferrule on the lid allows up to 2 psi (135 mbar) of top pressure for transfers, and a 2" tri-clamp port on the bottom of the cone makes trub dumps a snap. Particularly nifty is a dual-function valve that lets you transfer and sample beer or pull yeast and trub using the same valve.

The integrated 12-volt, 30-watt heating element makes it easy to gently warm your fermentation, while a built-in cooling sleeve only needs to be connected to an optional chiller to get that temperature down.

Using the Grainfather App, available for iOS and Android, brewers can monitor and adjust fermentation from anywhere in the world, a feature that could come in very handy as COVID-19 restrictions begin to relax. In the not-too-distant future, you may very well initiate a diacetyl rest while you sip an umbrella drink on the beach.

The Grainfather Conical Fermenter Pro retails for \$695. More information is available at grainfather.com.

OREGON CANNED FRUIT PUREES

Oregon Fruit Products LLC recently announced 16 newly branded Canned Fruit Purees packaged in shelf-stable 49-ounce cans for homebrewers. The new canned purees provide hobbyists the same level of quality that has been available to commercial brewers for more than two decades.

"Using fresh or frozen fruit can be tricky because of irregularities in quality and availability," says Chris Hodge, director of sales for fermentation at Oregon Fruit Products. "With Canned Purees available year-round, we hope to become part of discerning homebrewers' ingredient supply, keeping high-quality fruit within arm's reach whenever inspiration strikes."

All Oregon Canned Fruit Purees are certified kosher, contain no added sugar or preservatives, and are non-GMO, gluten-free, and vegetarian. Purees are available in apricot, blackberry, black currant, blood orange, blueberry, dark sweet cherry, cranberry, grapefruit, mango, passionfruit, peach, pineapple, pink guava, plum, raspberry, and strawberry.

For more information, visit oregonfruit.com.



AHA Governing Committee Election

Congratulations to Sandy Cockerham of Indianapolis; Jen Blair of Mableton, Ga.; and Christopher P. "Crispy" Frey of Hendersonville, N.C., your newly elected AHA Governing Committee (GC) members. Incumbents Sandy and Jen were re-elected to new terms, while Crispy has served on the GC in the past. The Governing Committee will participate in its annual meeting this summer.

The Governing Committee advises AHA staff and sets the course for the future of the organization. The members of the Governing Committee

volunteer many hours each year to serve the community of homebrewers through the GC and its many subcommittees. Pictures and contact info for all Governing Committee members can be found at HomebrewersAssociation.org/ahage.

Thank you to outgoing Governing Committee member Debbie Cerda for her service on behalf of the AHA membership.

Thank you to the eight candidates who ran in this year's election, and thanks to all the AHA members who voted!



BIG BREW

Saturday, May 1, the AHA's annual Big Brew day, celebrates National Homebrew Day, which is officially May 7. Once again for 2021, the 24th Big Brew, we're asking homebrewers worldwide to participate by pledging to brew at home. The official 2021 Big Brew recipes, Star Gazer Hazy Double IPA and Janet's Brown Ale, are available on pages 11 and 12 of this issue of Zymurgy and at HomebrewersAssociation.org.

For more information on Big Brew, and to pledge to brew your batch on May 1, visit HomebrewersAssociation.org.



Homebrew Legislation

In February, homebrewers in South Dakota successfully lobbied their state legislature to pass new homebrew legislation that amended the definition of homemade alcoholic beverages and lifted restrictions that had been unfavorable to homebrewers.



The amendment updates South Dakota's legislation to include cider as a permissible homemade alcoholic beverage to produce in limited quantities, and it permits homemade alcoholic beverages in licensed facilities for certain events, including organized affairs, exhibitions, competitions, and tastings.

The amendment also explicitly allows homebrewers to transport homemade alcoholic beverages from their households. Prior to the amendment's passing, cider had not explicitly been included in the statute, homemade alcoholic beverages were not permissible in licensed facilities, and transporting homebrew was not explicitly defined in the South Dakota alcohol code.

Representative Kirk Chaffee (Dist. 29) was the prime sponsor of the bill, along with John Griffith, Logan Steffans, and other members of the Ale Riders Homebrew Club in Rapid City, S.D., who were crucial in introducing the bill. House Bill 1109 cleared the South Dakota House and Senate on February 22, 2021 and was signed into law by Governor Kristi Noem on February 25, 2021.

For further details on this huge legislative win for South Dakota homebrewers, visit HomebrewersAssociation.org.

Homebrewers Being Awesome

HOMEBREWERS HELP NEIGHBORS IN TEXAS STORM

By Charles Scudder

When snow and ice hit Texas earlier this year, homebrewers stepped up to help neighbors weather the storm. Extreme demand on the state's energy grid forced millions to lose power in mid-February, which in turn wreaked havoc on city water systems and caused frozen pipes to burst in homes across the state. On top of historically low temperatures, thousands had water cut off to their homes. Nearly 15 million Texans were told to boil water before use.

Enter the brewers. Professional breweries began canning water and distributing straight from the brite tank. Homebrewers filled growlers, carboys, jugs and bottles, for themselves and neighbors, 5 to 15 gallons at a time.

Joshua Penn is a homebrewer in North Richland Hills, a suburb near Fort Worth. When the city issued a boil order, he plugged in his 10.5-gallon Anvil Foundry electric brew system. By the time the order was lifted a few days later, he had distributed nearly 50 gallons of clean water.

"#TexasStrong is more than just a hashtag," Penn said. "When things get hard we all rise up to help out those in need."

In south Austin, Steve G. Hinojosa began texting his neighbors when the water went out. Hinojosa works for Family Business Beer Company in Dripping Springs, west of Austin. With the industry's aluminum can shortage, he said the professional brewery was not able to open to distribute water. Instead, he turned to his local homebrew club to get the word out. He had water stored for his hot liquor tank in a brewhouse in his backyard, and he fired up his own propane system to help distribute even more.

A few years ago, Austin faced a similar water crisis. Hinojosa remembers brewers stepping in to provide clean drinking water to Texans then, too. When water became scarce again, he posted to Facebook to remind homebrewers that they had the ability to help their neighbors get through the winter storm.

"I was just trying to get a message out," he said. "If you're not thinking this way, you should be."

With temperatures still well below freezing, some homebrewers even filled up boil kettles with snow to melt for some essential uses. In Arlington, I set up my Blichmann Boilermaker to melt 10 gallons of snow. Several hours of propane and many more gallons of snow later, I had enough to share with my own neighbors for flushing toilets and washing dishes. →



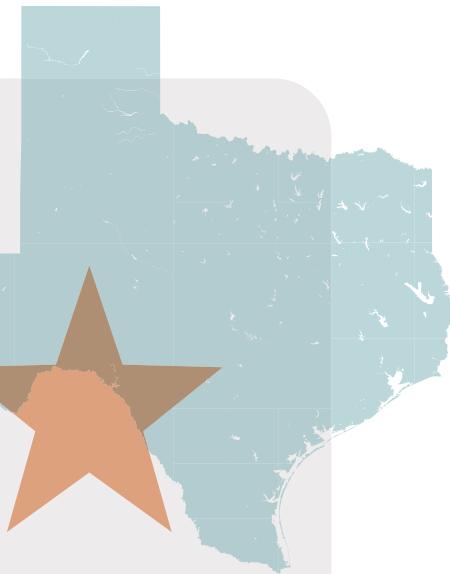
In south Austin, Steve G. Hinojosa boiled water for neighbors and friends during February's winter storm. Neighbors traded extra propane tanks for jugs and coolers full of clean drinking water.

Photo courtesy of Steve G. Hinojosa



Homebrewer Charlie Scudder boiled 10 gallons of snow in his Blichmann Boilermaker kettle when water was shut off to his home in Arlington, Texas, during February's winter storm.

Photo courtesy of Charlie Scudder



Adolph Postel boiled nearly 50 gallons for friends and neighbors when the Houston area was put on a boil order in mid-February. Photo courtesy of Adolph Postel



After boiling 10 gallons of snow, homebrewer Charlie Scudder distributed carboys full of water to neighbors to help out when water was shut off in Arlington, Texas, during February's winter storm.

Photo courtesy of Charlie Scudder

(Pro-tip: Boiling snow removes pathogens but doesn't get rid of pollutants. Especially in urban areas where heavy metals might be in the air or groundwater, it's best to run melted snow through a filter before using to drink, brew, or cook with.)

Homebrewer Adolph Postel works for a small energy company near Texas's Gulf Coast. After a long week of trying to get the state's energy system back online, he finally had a day off and turned to his new electric BrewBuilt kettle to help churn out clean water for friends. In his first day working from his garage in Seabrook, Texas, he distributed 30 gallons. One friend brought two ice chests to fill with water, and Postel said he was able to get water from the tap to a rolling boil in 17 minutes.

"Ten gallons for us doesn't sound like much, but for them that's ten 1-gallon jugs or two 5-gallon buckets," Postel said. "If I had a bigger system, I'd boil more."

The only downside, he said, was that he didn't have a counterflow chiller to quickly cool the boiling water. He tried calling his local homebrew store to pick one up, but they had a catastrophic pipe failure of their own to deal with. Once again, Postel said, his homebrew club—the Bay Area Mashtronauts—stepped in and provided scavenged supplies from sparge arms and spare PVC pipe to help fix the store owner's plumbing.

"If you're a homebrewer, you're pretty blessed," Postel said.



BIG BREW RECIPE: Star Gazer Hazy Double IPA

Double IPA

This hazy double IPA was formulated to showcase the tropical and juicy aromas from BSG Hops' Zamba blend and the minty and green-apple aroma notes from German Polaris hops. The grist is typical for the style, with a little boost from sucrose to increase wort gravity without adding non-fermentables or additional malt flavor. The hopping schedule and yeast strain are intended to set the stage for aroma retention and biotransformation while keeping hop bitterness in check. Ashton Lewis, experienced master brewer and national account manager at BSG, says, "The name was inspired by the 2020 Great Conjunction with the use of North Star Pils malt and Polaris (aka the North Star) hops."

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.064 (15.7°P)

Final gravity: 1.012 (3.1°P)

Color: 4 SRM

Bitterness: 35 IBU

Alcohol: 7% by volume

MALTS & ADJUNCTS

6.5 lb. (2.95 kg) Rahr North Star Pils Malt

3.25 lb. (1.47 kg) Rahr Red Wheat Malt

1.5 lb. (680 g) flaked oats

6 oz. (170 g) Weyermann Acidulated Malt

1 lb. (454 g) sucrose @ 60 min

HOPS

0.5 oz. (14 g) Polaris, 20% a.a. @ 60 min

0.5 oz. (14 g) Zamba, 10% a.a. @ 60 min

1 oz. (28 g) Polaris, 20% a.a., whirlpool/steep at 158°F (70°C)

1 oz. (28 g) Zamba, 10% a.a., whirlpool/steep at 158°F (70°C)

1.5 oz. (42 g) Polaris, 20% a.a., dry hop at day 2

1.5 oz. (42 g) Zamba, 10% a.a., dry hop at day 2

1.5 oz. (42 g) Polaris, 20% a.a., dry hop at day 4

1.5 oz. (42 g) Zamba, 10% a.a., dry hop at day 4

YEAST

Fermentis SafAle K-97, Omega OYL-044 Kolsch II, or Lallemand LalBrew Köln yeast

ADDITIONAL ITEMS

1 cup (190 g) corn sugar (if priming in bottles)

BREWING NOTES

If using reverse osmosis (RO) water, add 2 tsp. calcium chloride, ½ tsp. calcium sulfate (gypsum), and ¼ tsp. sodium chloride (non-iodized) to the mash water before mashing in.

Note that acidulated malt is included in the grist bill; mash pH following mashing-in should be about 5.4.

Mash the malts at 154°F (68°C) for 60 minutes. Start recirculating wort. Sparge slowly and collect 6.5 gallons (24.5 L) of wort. Heat to boiling and boil the wort 70 minutes, adding hops at the times indicated in the recipe. Adjust original gravity post-boil with RO water as required.

Chill the wort to 158°F (70°C), add third kettle hop addition, let steep for 10 minutes, and continue cooling wort to approximately 68°F (20°C). Pitch yeast, and ferment between 60 °F and 68°F (15.5–20°C) until complete.

Dry hops should be added on day 2 and day 4 of fermentation. If using hop bags for dry hopping, remove bags on day 7; if not, rack to secondary fermenter or keg equipped with spunding valve. Complete fermentation and any hop creep following dry hopping should be finished by about day 21.

Prime and bottle condition or serve from keg if naturally conditioned during aging.

PARTIAL-MASH VERSION

Replace the Pils malt with 4.4 lb. (2 kg) Briess Light Pilsen dried malt extract, omit the acidulated malt, and increase the sucrose to 1.25 lb. (567 g). Perform a mini-mash with the wheat malt and flaked oats at 154°F (68°C) for 45 minutes. The steep method is suggested using a grain bag and 1.5 gallons (5.7 liters) steep water. Remove the grain bag from the steep after 45 minutes, gently pour hot water over the steep bag to improve yield, add dried malt extract, and adjust kettle volume to 6.5 gallons (25 liters). Bring to a boil and follow the remaining recipe as above.

A Message from the AHA Director

BEERS DECIDE TO COME TOGETHER

As you have likely heard, we have canceled the in-person version of Homebrew Con 2021 and will be hosting our second virtual edition of Homebrew Con June 17–19. We can't wait to bring you an amazing virtual experience that lets you hear and learn from old friends and new.

For 2021, we will have to leave the homebrew-themed mass gatherings to the beers. We have about 5,000 beers from 2,000 American Homebrewers Association members coming together for the National Homebrew Competition.

To get a better feel for why the homebrew decided to cross the road, I interviewed a few of them. Here's what I heard.

"Look, at some point you have decide 'I'm ready' and just go for it. I'm not getting any more bitter sitting down here."

— *American IPA, Olathe, Kan.*

"I just want to meet someone new, feel that real-life touch of glass on glass with someone you just met but feel like you've known forever."

— *American Porter, Milford, Conn.*

"I know the delivery guys aren't gentle, but it'll feel nice to be held."

— *Imperial Stout, Bolingbrook, Ill.*



BIG BREW RECIPE: Janet's Brown Ale

American brown ale

Recipe courtesy of Mike "Tasty" McDole
and reprinted in his memory.

Janet's Brown Ale is no stranger to the world of homebrewing recipes. Mike McDole took home a medal when this recipe won gold in Category 10: Brown Ale at the American Homebrewers Association (AHA) National Homebrew Competition (NHC) in 2004. The award-winning recipe was then featured in Jamil Zainasheff and John Palmer's book, *Brewing Classic Styles*, as an example of a bigger, hoppier American Brown Ale. In 2009, McDole took gold again at the AHA NHC with an updated recipe that he categorized as Imperial Brown Ale, but this time in Category 23: Specialty Beers. Though Janet's Brown Ale deviates a bit from the style guidelines for a traditional American Brown Ale, surely you will not be upset by the higher IBUs and ABV after taking a sip!

If you prefer a more sessionable beer, feel free to omit the corn sugar to reduce the ABV from 7.4% to 6.6%.

Batch volume: 5 US gal. (18.9 L)

Original gravity: 1.074 (18°P)

Final gravity: 1.018 (4.6°P)

Color: 20 SRM

Bitterness: 38 IBU

Alcohol: 7.4% by volume

MALTS & ADJUNCTS

11.8 lb. (5.35 kg) pale malt

1.3 lb. (590 g) dextrin malt

1 lb. (454 g) 40L crystal malt

12.8 oz. (363 g) wheat malt

6.4 oz. (181 g) 350L chocolate malt

8 oz. (227 g) corn sugar @ 0 min

"What's sweeter than spending the afternoon with someone who didn't literally create you?"

— *Traditional Mead, Vancouver, Wash.*

"Anything that's not another Zoom call."

— *Spiced Beer, San Diego, Calif.*

"I watched them upholster the couch, make a sourdough starter, paint the kids' room, reorganize the garage and learn the Japanese art of paper folding, origami. I've seen enough."

— *American Wild Ale, Fenton, Mo.*

"I watched everything on Netflix. Every. Thing."

— *Specialty IPA, Rocky River, Ohio*

"Once he named me Tiger King of Beers, I knew it was time to go."

— *Pilsner, Houston, Texas*

"I'm just glad they didn't turn me into hand sanitizer..."

— *Strong European Lager, Silver Spring, Md.*

I look forward to seeing your beers in Colorado and seeing you on my screen, hopefully one last time.

Cheers,

Ryan

HOPS

1.25 oz. (35 g) US Northern Brewer, 5.1% a.a., mash

1.25 oz. (35 g) US Northern Brewer, 5.1% a.a. @ 60 min

0.75 oz. (21 g) US Northern Brewer, 5.1% a.a. @ 15 min

1.25 oz. (35 g) Cascade, 5.6% a.a. @ 10 min

1.75 oz. (50 g) Cascade, 5.8% a.a. @ 0 min (hopback)

1.75 oz. (50 g) Centennial, 10.5% a.a., dry hop

YEAST:

Lallemand LalBrew BRY-97 West Coast Ale Yeast, Fermentis US-05, Wyeast 1217-PC, West Coast IPA, or White Labs WLP001 California Ale Yeast

WATER PROFILE:

Ca 110 ppm, Mg 18 ppm, Na 17 ppm, SO₄ 350 ppm, Cl 50 ppm

ADDITIONAL ITEMS

1 cup (190 g) corn sugar (if priming in bottles)

BREWING NOTES

Mash the malts with the mash hops at 154°F (68°C) for 30 minutes. Raise to 170°F (77°C) and hold for 15 minutes. Sparge at 170°F (77°C) for 45 minutes. Collect 6.5 gallons (24.5 L) of wort. Heat to boiling and boil the wort 60 minutes, adding hops at the times indicated in the recipe. Adjust original gravity post-boil with reverse osmosis water as required. Chill the wort to approximately 68°F (20°C). Pitch yeast, and ferment between 60°F and 68°F (15.5–20°C) until complete. Prime and bottle condition or serve from keg if naturally conditioned during aging.

EXTRACT VERSION

Replace the pale malt and wheat malt with 7.5 lb. (3.4 kg) Briess Golden Light liquid malt extract and 12 oz. (340 g) Briess Bavarian Wheat liquid malt extract. Steep the dextrin malt, crystal malt, chocolate malt, and mash hops in a grain bag at 154°F (68°C) for 30 minutes in 1.5 gallons (5.7 liters) water. Remove the grains and mash hops and fully dissolve the malt extracts in the hot wort. Adjust kettle volume to 6.5 gallons (25 liters) with reverse osmosis water. Proceed with the boil and follow the remaining recipe as above.



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Recipe Resolutions



Dear Zymurgy,

My favorite style is Baltic porter, but I don't have the means of lagering. In Mark Pasquinelli's recent article ("Find Your Baltic Bliss," Jan/Feb 2021), the recipe for Baltic Bliss says to ferment at 60°F to 62°F (16–17°C) and then warm to 65°F (18°C) for a diacetyl rest. The text of the article leads me to believe I can then simply keg and carbonate.

The recipe, though, says to lager for two months at 35°F (2°C) after fermentation. I can definitely do this at ale temperatures, but if I have to lager at 35°F for a few months, then I cannot. Please advise! I've been wanting to brew this style forever!

Thanks much,
Adam Chumbley

Contributor Mark Pasquinelli responds:
An excellent question, Adam (and something I considered myself). One of the great things about homebrewers is our adaptability. While lagering at 35°F for two months would be ideal, I think the most important thing in the big picture is to simply give your high-ABV homebrew some time to condition, much as you'd do with a Russian imperial stout, even if the temperature is in the ale range. Please don't let a minor hurdle like this deter you from brewing a Baltic porter.

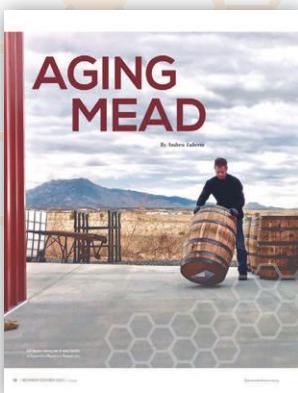
Dear Zymurgy,

I am going to make the hot sauce recipe from Amahl Turczyn's article on the subject (You Can Ferment That!, Sept/Oct 2020). The recipe calls for rice vinegar in the ingredients list, which makes sense for the recipe. However, it doesn't say when or how to add the vinegar. When do I add that ingredient? As part of the brine? Any help is much appreciated.

Thanks,
Tom Flannagan



Amahl Turczyn responds: The text references rice or coconut vinegar for quick (unfermented) hot sauce. That vinegar is the acid that preserves the sauce and adds flavor. In fermented hot sauce, lactic acid bacteria produce their own acid via fermentation, so you don't necessarily need to add vinegar. But if you'd like to do so, add it at bottling with any other desired flavorings—garlic, cumin, peppercorns, etc. As vinegars go, I feel coconut and rice vinegars work better, as they aren't as strong-tasting as, say, cider vinegar.



MUSINGS ON MEAD

Dear Zymurgy,

Belated musings on Andrew Luberto's article, "Aging Mead," in the Nov/Dec 2020 issue. Having made mead and observed (tasted!) homemade meads for close to 40 years, I have witnessed the practices that led to the myth that mead required long aging.

In the early days, fermentations were poorly managed, and nutrients were especially lacking in traditional meads and metherglings, which led to long fermentations. But it was obvious that increasing the temperature

would speed up fermentation, so meadmakers would frequently ferment at 75°F (24°C) or warmer. These higher temperatures, along with stressed yeast, encouraged production of unpleasant esters that then had to "age out." Sometimes they did (somewhat).

Moreover, in the old days of simple beermaking, brewing was commonly a cool-weather activity that took advantage of favorable temperatures. This relegated meadmaking to summer months, which only encouraged too-high fermentation temperatures.

Ken Schramm's 2003 book *The Compleat Meadmaker* brought science to meadmaking. In particular, it highlighted proper nutrient use. I saw a sea change in the quality of homemade meads after Schramm's book became widely known. Schramm built on the research of Morse and Steinkraus and made his work accessible to a broad audience.

Luberto emphasizes pH management, as did Schramm. But I would point out



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that mead musts (excepting melomels) are poorly buffered, hence difficult to measure accurately. Moreover, dissolved carbon dioxide during fermentation dramatically reduces the apparent pH. Degassing samples before measuring pH makes a world of difference.

Dick Dunn
Hygiene, Colo.



DEAR ZYMURGY

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HOMEBREW LABEL SUBMISSIONS

Cellar Dweller was a labor of love that had nothing but potential and fell flat on its face in a huge way. We brewed our first imperial stout and aged it in a liqueur digestif barrel I had picked up for a good price. We aged a small amount of the stout outside the barrel in a few bottles, and those tasted amazing. The barrel-aged version, however, took on an interesting flavor over time and was later dubbed "Tussin," which was the only word that truly described how it tasted—pure cough syrup, not worthy of your worst enemy. It was destined for the sink. The name comes from its having resided in my basement for months, and the back label gives a little more history as well.



CELLAR DWELLER BARREL AGED IMP. STOUT

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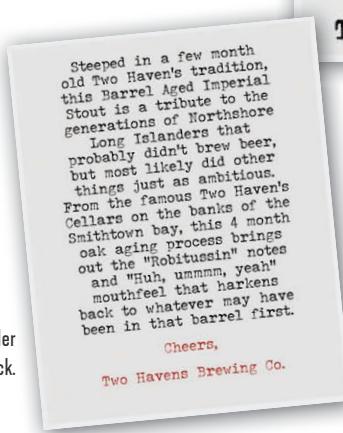


LONG DAY IPA

East Northport, NY

TWO HAVENS BREWING CO

Cellar Dweller
label back.



Long Day IPA was part of our second ever double brew day. Our first double brew day was a two-man operation—exhausting to say the least, but relatively manageable. This second double brew day had all hands on deck and, with five of us, should have been super simple. Time flew by, and we were not always as organized or focused as we should have been (we overshot the temperature of the strike water and had to wait for it to cool down). We were wiped out by the end of the double brew session but very pleased with the end result, which was a solid IPA worth our efforts.

Dave Oksenhorn – Melville, N.Y.



Simcoe



Seve



Rigby

BREWING BUDDIES

This is our brew dog Simcoe. She's always here for brew day and makes sure no one messes with the wort. Today we made an IPA, with Simcoe hops, of course.

Molly Ball
Syracuse, N.Y.

This is Seve (formerly A-184), who decided he would rather be a brewing assistant than work for the Department of Homeland Security. Now he's head of quality control.

Craig Henrichsen
Coppell, Texas

Meet my brew buddy Rigby. He lets me brew in his space in return for all the pets in the world!

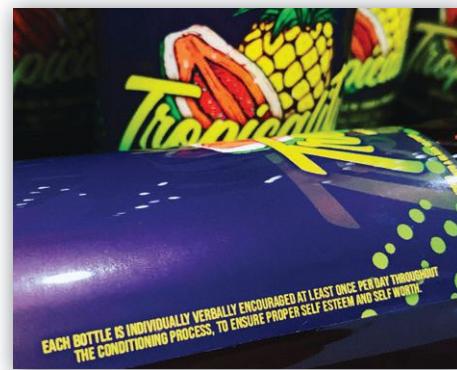
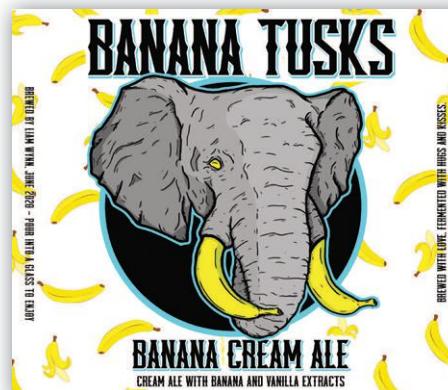
Brian Haas
Kearney, Neb.

HOMEBREW LABEL SUBMISSIONS

Banana Tusks was my very first homebrewed beer. I brewed a cream ale with banana and vanilla, so I brainstormed label concepts during my commute. I love elephants, and I was already drawing an elephant head for no particular reason. While driving in freeway traffic, my brain placed bananas as the elephant's tusks, so I went home the same night and sketched out the label for Banana Tusks before the beer was even in bottles.

Tropicality is a heavy-hitting (8% ABV), flavorful imperial ale that tastes like a guava-pineapple concoction drink from a local overpriced smoothie shop. I started with a base recipe for what would roughly equate to an imperial blonde ale, and then I conditioned the beer on roughly 1.5 pounds per gallon (180 g/L) of guava and pineapple. Based on the results, I knew the name had to be short, sweet, and fun to say—almost as fun as the beer is to drink.

Liam Wynn
Murrieta, Calif.





Lucy and Lily have been brewing with me ever since they were brew pups. They watch over the mash and make sure I use the spent grains for treats later!

Sean Callahan
Cary, N.C.



Here's new brew pup Barley, anxiously waiting for her first Irish ale to finish!

Steve Milvet
Medina, Ohio



DEAR ZYMURGY

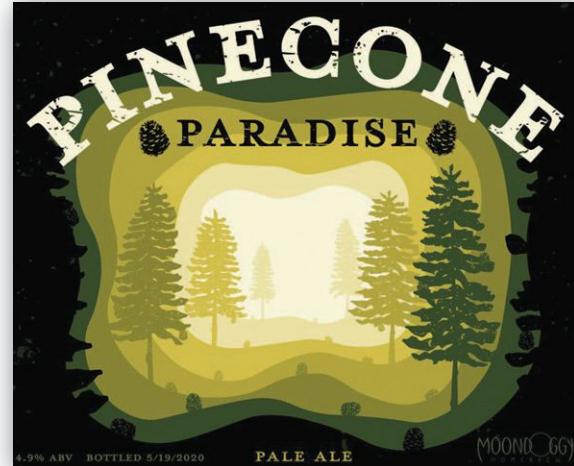
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HOMEBREW LABEL SUBMISSIONS



Pinecone Paradise is a tribute to Deschutes Mirror Pond Pale Ale, which I discovered in 2008 on a memorable family RV trip from Ohio to my cousin's wedding in northern Idaho. At that time, Deschutes was not distributed to Ohio, at least not that I was aware of.

I recently discovered a clone recipe for Mirror Pond and brewed it with my son, Ben. I wanted to name the beer to commemorate that trip out West, so I reviewed a trip journal we had kept in the RV, in which all family members made entries whenever they felt inspired. Our daughter Katie, who was eight at that time, made a detailed entry in which she described an imaginary restaurant she created with her siblings and a couple of other children they met. They made various "meals" for the restaurant from things they found around them: pine cones, pine needles, flowers, sticks, etc.



From eight-year-old Katie's journal entry: "I like to call it pine cone paradise because the resteront was in pine trees."

Voila! The beer would be named "Pinecone Paradise." When I told Katie, now 20, about the beer and its inspiration, she asked to create the label. She is currently a student at the University of Cincinnati majoring in visual communications. The result was this wonderful artwork that has garnered many compliments. Last year, Katie also created the wordmark for my homebrewery moniker, Moondoggy Homebrew.

Don Geldien
Frogtown Hoppers
Sylvania, Ohio

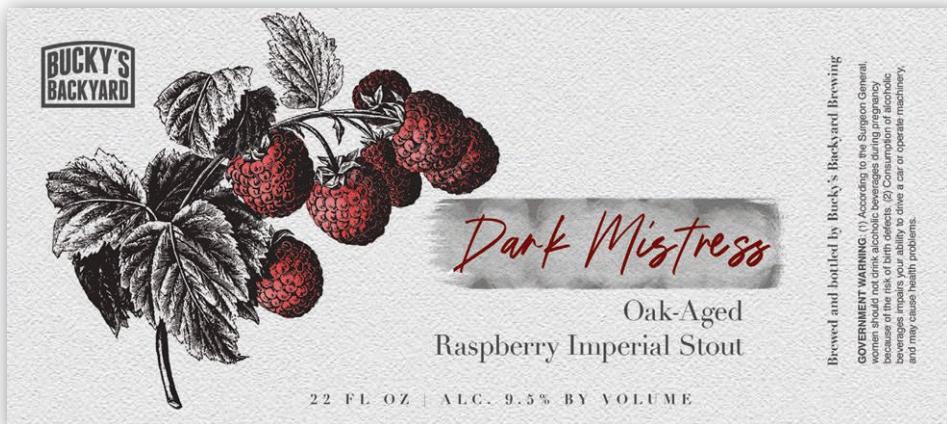


SUBMIT YOUR LABEL

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

Send them to us at HomebrewersAssociation.org/magazines/submit-bottle-label and we will take it into consideration!

HOMEBREW LABEL SUBMISSIONS



Brewed and bottled by Bucky's Backyard Brewing
GOVERNMENT WARNING: (1) According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. (2) Consumption of alcohol increases the risk of breast cancer and may cause health problems.



My French oak-aged raspberry imperial stout clocks in at 9.3% ABV. It is slightly tart from the raspberries, has smooth dark chocolate and coffee flavors, and is delicious. I like to give a bottle each year out for Christmas gifts, and this is the beer I chose to make.

David Buchanan
Spanish Fork, Utah



My homebrewery is lucky to have a talented graphics department: my lovely wife. She and one of our favorite weekend meals inspired the beer and the label.

The recipe is a simple pale ale, with white rice included in the mash, and pu-erh tea and chrysanthemum buds added at flameout. Rice and tea are common items on the table at a dim sum eatery.

I submitted this beer to the 2019 Philly Homebrew Cup and received a sweet bronze medal for its style category. It made for a great, easy-drinking summer beer, and I look forward to bringing it back soon. Cheers!

Michael Parks, Jr.
Philadelphia, Pa.

For two and a half years, I traveled between San Francisco and Philadelphia weekly. In scanning the Philly beer scene, I soon discovered Tired Hands Brewing Co., the founder of which, Jean Broillet, also started in a garage. While I no longer make that killer commute, I do so miss standing in line in the snow for the chance to buy and drink Alien Church (NEIPA) and Tired Hands' many other great beers.

In an attempt to cope with the loss, I brew HEXEN, my tribute to Alien Church. It includes a few personal spins: Champagne mango cubes, kveik yeast, and no reptoids on the label.

Cheers!
Scott Key
Corte Madera, Calif.



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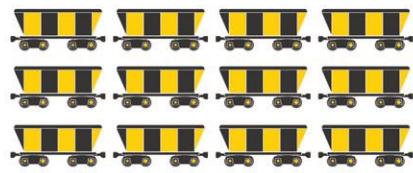
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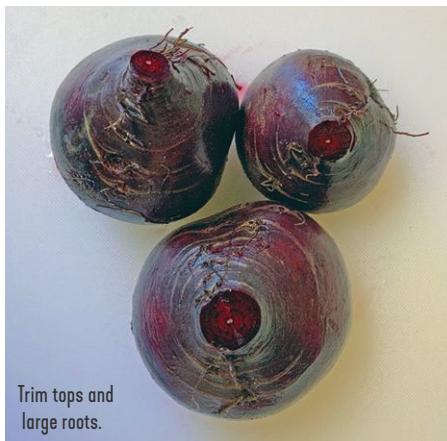
BEET KVASS

By Amahl Turczyn

Kvass is a Slavic beverage typically made with baked rye bread, water, and sometimes barley or wheat malt flour that is mixed to a loose, liquid consistency, lightly warmed to encourage enzymatic starch conversion, and then allowed to ferment for several days. It is never boiled, so in addition to natural yeasts present, there are often lactic bacteria. It's usually not classified as an alcoholic beverage, as alcohol content is kept under 1 percent by volume. →



Start with fresh beets.



Trim tops and large roots.



Dice into 1" (2.5 cm) cubes.

After fermentation, the enzyme-, yeast-, and bacteria-rich brown liquid is poured off and bottled for consumption; some people add fruit, herbs, or spices. The solids are kept as a kind of sourdough starter for the next batch of sour rye bread. It's a nourishing beverage that, like makgeolli in Korea, is available commercially, but the best and healthiest versions are homebrewed.

Historically, kvass was said to be the chief beverage of monks and peasants, who preferred it to water. But, as with many probiotic fermented beverages, it evolved



Beet Kvass

Batch volume:

about 0.75 qt. (700 mL) liquid from a 1 qt. (1 L) ferment

FERMENTABLES

3 medium-large, fresh beets
1 tsp. sea salt
filtered water
2 Tbsp. starter liquid (fermented pickle brine, kefir whey, sauerkraut, or kimchi juice), optional
2–3 fresh, whole garlic cloves, optional
2 fresh ginger root slices, optional
other herbs or flavorings (fresh dill, black peppercorns, mint, raisins, etc.), optional

EQUIPMENT

1-quart Mason-style jar with tight-fitting lid or airlock

NOTES

Trim beets of tops and roots, but don't peel. Scrub thoroughly and dice into 1" (2.5 cm) cubes. Place beets in sanitized 1 qt. (1 L) Mason-style jar along with garlic and ginger, if using; sprinkle beets with sea salt, then pour filtered water over beets. Top off with 2 Tbsp. active starter liquid, if using. Cover tightly with lid or airlock—if using lid, remember to burp the gasses off daily. Ferment at ambient temperatures (65–70°F or 18–21°C) for 4–7 days until tart aroma develops. Strain off liquid to another container and refrigerate, using as needed. Jar may be refilled with fresh brine for subsequent batches. If mold develops, or liquid becomes slimy, discard and start over.



into endless varieties, some without rye bread as a base. We will focus on one of the healthiest and most attractive versions of kvass, one made from raw beets rather than baked bread.

While the earthy flavor of beets isn't to everyone's liking, beet kvass is an excellent liver tonic and therefore popular as a cleansing detox brew among brewers and other beer enthusiasts. This recipe, in particular, is flavored with garlic and ginger in addition to beets, and the resulting tart, earthy beverage makes for a wonderful pick-me-up on brew days when you want to stay focused and alert. It's also great for heart and gut health.

Beet kvass is very easy to make, especially if you have a starter brine from another lactic-acid-bacteria-based food fermentation. Sauerkraut juice, kimchi juice, kefir whey, and fermented pickle juice can all be used to jumpstart kvass fermentation and can turn the typical one-week ferment into just a few days. Personally, I like to dip into my jar of fermented serrano peppers, as the slight chile kick goes great with the garlic, ginger, and beet flavors.

BEET PREPARATION

Beets grown in your own garden are, of course, preferred, but organic beets from the farmers market or grocery store work fine, too. Cut the tops off of three medium-large beets and save those greens for eating (they are also tremendously good for you, so don't just compost them). Pick the hairy roots off each beet and scrub the roots well under cold water to remove any soil. Don't peel them; most of the natural yeasts and beneficial bacteria are on the skins of the raw roots. Finally, dice them into roughly 1-inch (2.5 centimeter) cubes. It doesn't have to be pretty. You don't want to shred or puree them, though, because that releases too much sugar too quickly, and you'll end up with alcoholic beet beer.

MIX THE BRINE

Kvass brine requires less salt than pickle brine—only a teaspoon of pure sea salt per quart of carbon- or reverse osmosis-filtered water (5 mL salt per liter of water). Dump the beet chunks into a clean Mason-type quart jar, sprinkle in the salt, and fill almost to the top with water. At this point, you can also add a few cloves of fresh, peeled garlic and a couple of slices of fresh ginger root. The ginger, in particular, is a good source of natural yeast and enzymes and will help with the fermentation as well as add its warming, invigorating flavor.



Salt can be sprinkled right onto the beets.

PITCH A STARTER (OPTIONAL)

As with any lactic fermentation, getting the pH down quickly is beneficial. The natural bacteria and yeasts on the beet skins will ferment spontaneously but may take several days to get started, depending on the ambient temperature. You don't need much starter—just a couple of tablespoons of active brine or whey, or of the juice from sauerkraut or kimchi, will be plenty for a 1-quart (1-liter) batch.

COVER AND FERMENT

You'll want a tight-fitting lid for your fermenter, or a Mason-jar airlock specifically designed for home food fermentation.

Keeping oxygen out is important since the brine is relatively low in salt. Place the jar in a dish or something to catch any escaping juices (beet juices are wonderful at staining countertops), make sure all vegetable solids are submerged, and crank down the lid tightly. Then leave at ambient temperatures for four to seven days, checking the kvass daily and burping off any pressure that may form. You should be able to see bubbles rising from the ferment after a day or two.

Begin tasting the liquid after day three. It should develop a pleasant lactic tartness.

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When the acidity meets your approval, simply strain the liquid into another container and enjoy. You can do a couple of subsequent batches from the same beet solids by simply repeating the brine addition and leaving the same jar to referment; they will ferment faster, but the kvass will have a lighter flavor and color.

In hot climates, mold may develop; if that's the case, or if you notice the kvass becoming viscous or slimy, it's best to toss the batch and start over. You may choose to add the fresh juice of half a lemon to the brine, which will lower the pH faster (and it tastes great with the beets.)

That's it! Try this brilliant crimson elixir with ice and a lemon wedge, perhaps with a shot of peppery first-press olive oil. You can also use golden beets for this recipe, or feel free to experiment with other root vegetables along with the beets: radish, horseradish, carrots, and turnips are all options. You can also add herbs and spices to change things up if you find yourself making kvass regularly. Fresh dill with red beets is particularly good. Kvass is a tasty and healthy probiotic fermented drink—and your liver will thank you for it.

Amahl Turczyn continues to brew and write at his home in Lafayette, Colo.

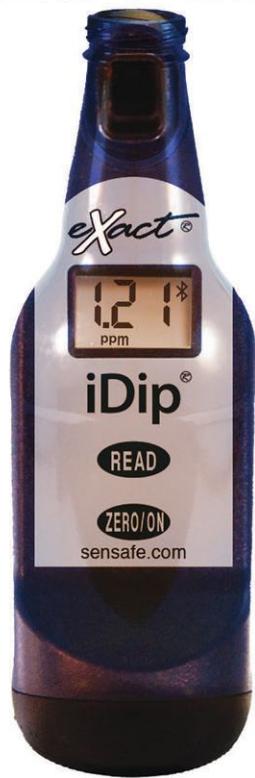


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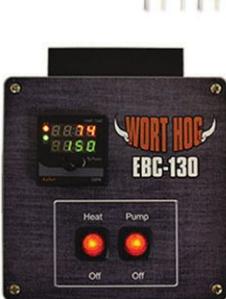
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Get More Out of Your Brewing Appliance

By Jason Chalifour

When my partner and I purchased our home, I was excited to have a small yard in which I could brew outside. New England winters are cold and snowy, while spring and autumn can be cool and wet. My hectic work schedule at the time didn't always make it easy to reschedule a brew day ruined by weather. Shortly after moving into our new home, I purchased a Brewer's Edge Mash & Boil, a self-contained unit that performs the two functions indicated in its name. →

Brewing appliances like the Grainfather, BrewZilla (formerly Robobrew), Mash & Boil, and Anvil Foundry are becoming increasingly popular among novice and experienced homebrewers alike. When used as intended, these machines make it easier than ever to brew a 5-gallon (18.9-liter) batch almost anywhere.

I have been fortunate to visit hundreds of breweries, and every brewhouse has some kind of limitation. Professional brewers are constantly brainstorming workarounds and figuring out ways to get the most out of their setups. Having owned my appliance for three years, I have experimented with different ways to use it. Along the way, I've developed a few methods for getting the most out of my device.

COOLER MASH METHOD

Mashing in a cooler might seem counterintuitive when a key selling point of a brewing appliance is being able to electronically control the mash temperature. However, there are benefits to mashing in a separate tun and using the brewing appliance as a large water heater. Brewers who previously used a cooler and propane burner can employ this method without the need for much additional equipment.

The cooler mash method works around two limitations of many brewing appliances: (1) the finite grain capacity of the appliance and (2) the need for an external heating source to heat sparge water.

An appliance's grain capacity limits the original gravity of wort a brewer can

achieve for a given batch size. If your appliance is in a basement or garage, that can mean having to heat sparge water on a kitchen stove and carry it to where you are brewing. Carrying up to 4 gallons (15.1 L) of 170°F (77°C) sparge water down my narrow basement stairs is an accident waiting to happen. I can imagine explaining to a doctor or nurse how I fell down the stairs and scalded myself at the same time!

Other than an insulated cooler mash tun, the only additional equipment needed is a couple of plastic buckets and maybe some tubing. Old plastic fermenters that are stained or scratched, or buckets you just don't feel comfortable fermenting in anymore, will work just fine to collect wort since you will boil it.

Here's how to use the cooler mash method with your brewing appliance.

1. Heat mash water in your brewing appliance. (Bonus points if you collect and treat the mash water in advance of your brew and set a timer for the heating elements to kick on. There's nothing like mashing in right after rolling out of bed or finishing a workday.)
2. Once the mash water has reached your desired temperature, transfer the hot water to your mash tun.
3. Mash in your grain with the hot water in the mash tun.
4. During the mash, fill your appliance with sparge water and set the appliance's thermostat to 170°F (77°C).
5. When the mash is complete, place a bucket below the tun to collect wort.

From here you can simply drain your cooler mash tun into the bucket if you batch sparge, or you can run heat-proof tubing from your appliance to the mash tun for fly sparging. I have fly sparged using both gravity and a pump (see pictures).

6. Collect enough wort in buckets to hit your desired pre-boil volume.
7. Empty the appliance of any excess sparge water and then pour the collected wort into the appliance. Transferring with a pitcher is lighter and potentially less messy than lifting and dumping 6 to 7 gallons (22.7 to 26.5 liters) of hot wort.
8. Boil and finish your brew in the appliance as normal.

MINI-COOLER, MINI-BATCH METHOD

The 5-gallon batch has long been the standard homebrew batch size. Most brewers who buy a brewing appliance do so with the intention of brewing full batches, but there are times where brewing smaller batches may make more sense.

Anyone who has brewed a SMaSH (single malt and single hop) beer for tasting or sensory purposes knows these beers can become boring to drink. If a brewer is trying to improve a recipe by brewing multiple iterations the same thing, the volume of mostly similar beer can add up. It took me four batches to dial in my house milk stout recipe. I drank a lot of milk stout. By the time I had dialed in the recipe, I was bored of milk stout, and



“The mini-cooler, mini-batch method allows you to make up to four 1-gallon batches in one day.”

I haven't brewed the recipe since I perfected it.

The mini-cooler, mini-batch method allows you to make up to four 1-gallon (3.8-liter) batches in one day. The only additional equipment and supplies needed are a 2-gallon (7.6-liter) beverage cooler, a wire strainer, a 2-gallon (7.6-liter) pot, a stove or small burner that can boil 1.5 gallons (5.7 liters), a 1-gallon (3.8-liter) pitcher, a plastic tub or small cooler, ice for an ice bath, and four 1-gallon (3.8-liter) fermenters. All of these items are inexpensive and easy to find.

Here's how to do the mini-cooler, mini-batch method with your brewing appliance.

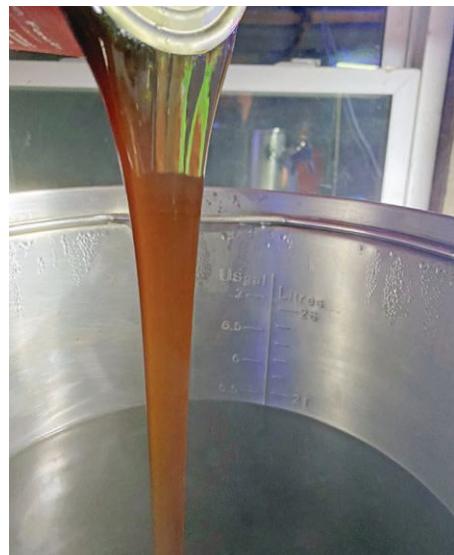
1. Weigh out the grain for each batch and mill the grain if you haven't already done so at the homebrew shop.
2. Fill your brewing appliance and set the temperature to your desired strike water

3. When the strike water has fully heated, transfer some of the hot liquor to your beverage cooler and mash in batch #1.
4. After mash #1 is complete, strain the mash into your 2-gallon pot and start the boil.
5. Halfway through the boil, mash in batch #2 using the same approach as above.
6. Place 1-gallon pitcher in a plastic tub and pack ice around the pitcher.
7. At the end of the boil, pour batch #1 into the pitcher and let cool in the ice bath.
8. Once wort has reached pitching temperature, transfer to a sanitized 1-gallon fermenter.
9. Repeat for the next three batches.
10. After batch #3 is mashed in, top off water in brewing appliance to ensure you have enough water for batch #4.

Fermenting mini batches.



Pouring liquid malt extract.



Old 755

English Barleywine

Batch volume:	5.25 US gal. (19.9 L)
Original gravity:	1.108 (25.5°P)
Final gravity:	1.033 (8.3°P)
Efficiency:	70%
Color:	17 SRM
Bitterness:	51 IBU
Alcohol:	10.2% by volume

MALTS (22 LBS)

10 lb.	(4.54 kg) Muntons Maris Otter Malt
10 lb.	(4.54 kg) Muntons English Planet Pale Malt
1 lb.	(454 g) Muntons Wheat Malt
12 oz.	[340 g] Muntons Crystal Malt 240 (90L)
4 oz.	[113 g] Muntons Light Chocolate Malt

HOPS

1 oz.	[28 g] Nugget, 13% a.a. @ 60 min
1.5 oz.	[43 g] Brewer's Gold, 8.5% a.a. @ 20 min

YEAST

2 sachets [22g] Lallemand Nottingham

INSTRUCTIONS

Heat 7 gal. (26.5 L) water to 164°F (73°C). Transfer strike water to mash tun and mash in at 152°F (67°C). Heat 4 gal. (15.1 L) of sparge water to 170°F (77°C) in your appliance. Collect 7 gal. (26.5 L) of wort. Optionally check pre-boil gravity and adjust with light dried malt extract to achieve pre-boil gravity of 1.084 (20.2°P). Boil 115 minutes, adding hops as indicated. Ferment at 65°F (18°C). Transfer to secondary after 3-4 weeks and age up to 6 months before packaging.

EXTRACT

Steep specialty malts and replace the Maris Otter malt with 6.6 lb (3 kg) Muntons Maris Otter Light liquid malt extract, Planet Pale Malt with 6.6 lb. (3 kg) Muntons Extra Light Liquid Malt Extract, and Wheat Malt with 1 lb. (454 g) Muntons Wheat Dry Malt Extract. Start with 6.5 gal. (24.6 L) pre-boil volume, and shorten boil to 60 minutes. Use the fast extract method described in the article.

Brew
This!



Rundown

Irish Red

Irish Red Ale

Batch size:	5.2 US gal. [19.9 L]
Original gravity:	1.049 [12.2°P]
Final gravity:	1.013 [3.3°P]
Efficiency:	70%
Color:	13 SRM
Bitterness:	17 IBU
Alcohol:	4.7% by volume

MALTS & ADJUNTS

6.6 lb.	[2.99 kg] Muntons Maris Otter Liquid Malt Extract
8 oz.	[227 g] Muntons Cara Malt 30 [15L]
2 oz.	[57 g] Muntons Crystal 400 [150L]
2 oz.	[57 g] Muntons Roasted Barley

HOPS

1.0 oz.	[28 g] Fuggle, 4.5% a.a. @ 60 min
0.3 oz.	[7 g] Fuggle, 4.5% a.a. @ 15 min

YEAST

Irish Ale Yeast or Fermentis SafAle S-04

BREWING NOTES

Steep Cara Malt, Crystal 400, and Roasted Barley in 155°F [68°C] water for 30 minutes. Remove specialty malts and fully dissolve liquid malt extract in the resulting wort. Top up with water to desired boil volume and boil 60 minutes, adding hops as indicated.

Chill wort to 65°F [18°C] and ferment until specific gravity stabilizes at or near the indicated final gravity. Bottle or keg.

ALL-GRAIN OPTION

Replace Maris Otter Extract with 8 lb. [3.63 kg] Maris Otter Pale Malt and mash at 152°F [67°C]. Lauter, sparge, bring to a boil, and continue as above.

EVEN FASTER EXTRACT VERSION

Start with 6 gal. [22.7 L] of water and pre-program your appliance to boil. Skip the specialty malts. Replace Maris Otter malt extract with Amber Malt Extract. Add 1.25 oz. [35 g] Fuggle and boil 30 minutes.

The first time I used this method was to make a series of SMAsh blonde ales to compare the flavors of different base malts. Chewing on malt gives you a clue as to the malt flavor, and methods like the American Society of Brewing Chemists' Hot Steep Method have proven that malt flavor from steeping will be present in a finished beer. Those methods are great, but the best way to evaluate any brewing ingredient is to evaluate it in beer.

Brewing four small batches on the same day removes potential variables when you taste and evaluate the finished beers. Chances are all four batches will ferment in the same place, at the same temperature, for the same period of time. If you brewed four different IPAs, you will know when you evaluate them that all four beers are equally fresh.

FAST EXTRACT BATCH METHOD

Using a brewing appliance to brew an extract batch might seem more convoluted than mashing in a cooler while using a brewing appliance. Isn't the point of a brewing appliance to make all-grain brewing easier? What's the point?

Maybe a well-meaning friend gave you an extract recipe kit as a gift. Maybe you have a hankering to re-brew an extract batch you remember really enjoying. The reason I enjoy this method is time.

I was able to steep specialty malt, add malt extract, do a full-volume boil for 60 minutes, chill my wort, and pitch in exactly three hours. I used Maris Otter extract as my base. Had I brewed this batch from grain, my base malt would have been Maris Otter pale malt. I spent a little more on ingredients, but my brew day was at least two hours shorter, and I made the exact same beer.

All you need for this method are a couple of extra pots and a wire strainer.

1. Fill appliance with 6.5 gallons (24.6 liters) of water. Program timer to start 90 minutes before you plan to start brewing and set it for 160°F (71°C). Mill specialty grains, if any.
2. Pull off 1.5 to 2 gallons (3.8 to 7.6 liters) of brewing liquor into one of your pots and steep specialty malts. If doing a partial mash, wrap the pot in a blanket to insulate.
3. Place any liquid malt extract (LME) cans in another pot and fill that pot with hot water to loosen the LME.
4. While the specialty malt steeps, set your appliance to a boil to heat the rest of your water.

5. With 10 minutes remaining in the steep or mini mash, turn off your appliance, and add the malt extract.

6. To rinse the inside of liquid extract cans, hold the can with an oven mitt or hand towel, and fill the can with hot liquid from the appliance using the appliance's ball valve. Be very careful when handling hot liquids.
7. When extract is thoroughly dissolved, turn the appliance back on and set to boil.
8. Strain out specialty malts and add liquid to the wort you just made with the malt extract in the appliance.
9. Boil as and cool as normal.

To make your extract brew day even quicker, you can shorten the boil. In all-grain brewing you can sparge longer and boil off liquid to collect more fermentable sugars. When using malt extract, all of the fermentable sugars have already been collected for you. The only reason to boil a wort made with malt extract is to isomerize hop alpha acids.

An extract brew can be further shortened by replacing steeped specialty malts with colored malt extract. Admittedly, you lose a bit of control over your recipe, but conversely, you eliminate several steps. You can program your appliance to come to a boil, shut it off, add your extract, turn it back on, and return it to a boil. With a shorter boil and no steeped specialty malts, you should be able to complete a batch in under two hours.

Mashing in a cooler.





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OTHER TIPS AND TRICKS

I'll say it again—the timer function is your friend. There's no reason not to collect strike water the night before brew day, or in the morning if you plan to brew at night. Program the machine to click on 90 minutes before you plan to start brewing.

If you are buying a separate chiller, I can't recommend a 50-foot immersion chiller enough. The top coil of my chiller sits less than an inch below the 5-gallon mark in my Mash & Boil. Depending on the ground water temperature, I can chill a batch in 10 to 15 minutes.

Add the chiller at flameout and steep for 15 minutes. Brewers conventionally place the immersion chiller in at 15 minutes and let it sterilize in the boil. If I put my 50-foot chiller in at 15 minutes, the temperature immediately drops, and the heating elements aren't powerful enough to return the wort to a boil in 15 minutes. Instead, I put my chiller in at flameout, turn the heating elements off, and let it steep for 15 minutes before starting to run water through the chiller. The wort is still hot enough to sterilize my chiller even if it is below a boil.

While the chiller sterilizes in the hot wort, the wort remains hot enough to isomerize alpha acids and increase bitterness. Instead of adding flavor and aroma hops toward the end of the boil, add them while steeping your chiller. Based on my rough calculations and experience, a 15-minute steep is roughly the same as a 5-minute boil addition.

Fly sparging with gravity.



“
Part of being a homebrewer
is finding new ways to make
what you want to drink with
the equipment you have.

Always use a hop bag when using leaf, whole cone, or homegrown hops. In my experience if even one loose cone in your wort will clog the ball valve. If your hop bag isn't tethered to something, the hop bag will cause clogging. At least a hop bag can be scooped up by a spoon.

These are just a few ways I have found to brew as efficiently as possible with my setup. Part of being a homebrewer is finding new ways to make what you want to drink with the equipment you have.

Jason Chalifour has been a homebrewer since 2012, is a BJCP Certified beer judge, and started the blog The Would-Be Brewmaster in 2014. Jason has been a sales executive with Muntons since 2017 and is usually at the Muntons booth during Homebrew Con.

Rinsing a can of liquid malt extract.



SMaSH Sensory Blonde Ale

Batch volume:	1 US gal (4 L)
Original gravity:	1.046 (11.4°P)
Final gravity:	1.010 (2.6°P)
Efficiency:	70%
Color:	varies with base malt
Bitterness:	25 IBU
Alcohol:	4.7% by volume

MALTS

2 lb. (907 g) base malt of your choice

HOPS

0.15 oz. (4 g) Cluster, 7.8% a.a. @ 60 min

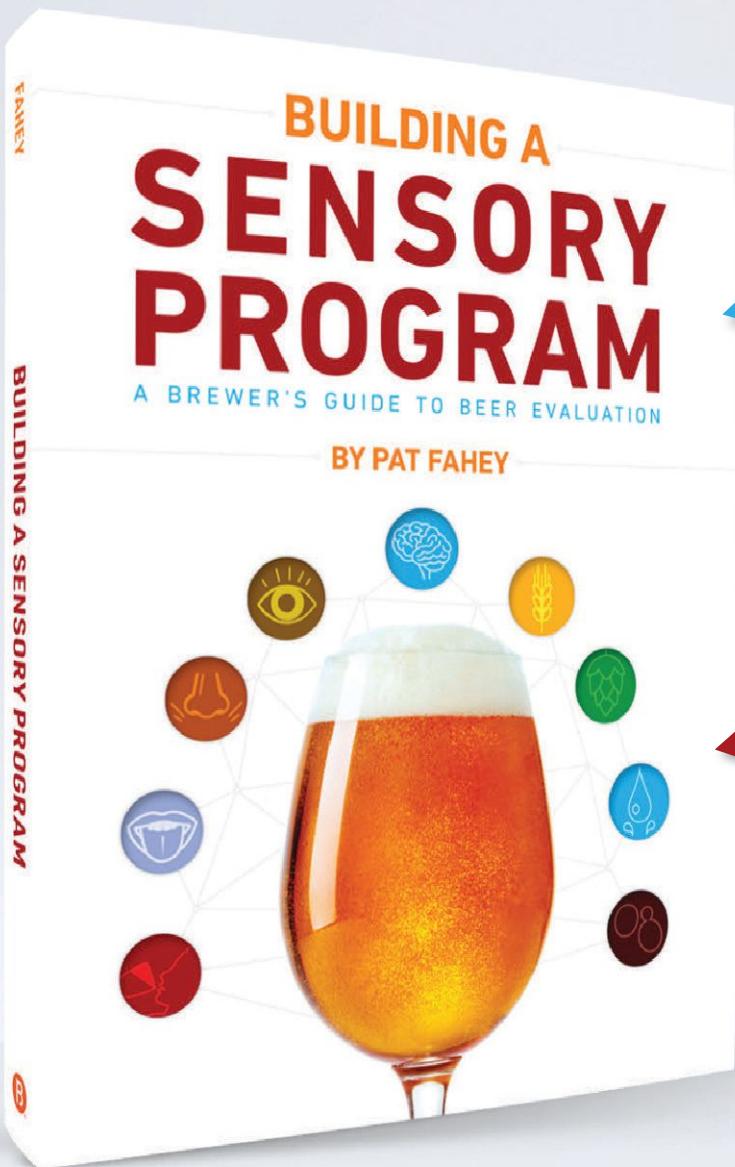
YEAST

½ sachet (5.5 g) Fermentis SafAle US-05

BREWING NOTES

Mash at 152°F (67°C) for 60 minutes. Use the same base malt in each batch, but use different hops, specialty malts, or different yeasts. Use 1.2 lb. of dry malt extract in place of base malt for an all-extract version.

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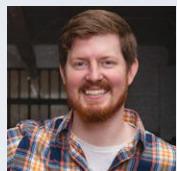


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IT MIGHT BE A SCHWARZBIER

By J. K. Bywaters

Photos by Aaron Colussi

“Brewing is a lot like cooking,” I’ve said many a time. “You just have to wait somewhere between a month and a couple years before you try your recipe.” Not everyone *cooks*, though. Most everyone has found occasion to boil water to make pasta from a box, but not everyone has rolled out the dough for their own ravioli. When two people who like to cook meet each other, there’s a recognition and a chance off the bat for some real camaraderie. It’s like that among brewers, vintners, and makers of meads, too. There’s

the happy resonance of “Ah—you’re one, too!” And there’s the chance of having not only lucked into a new friend, but a new friend who has stories. Brewers tend to have stories. I’ll tell you one now.

It’s always a treat to meet another brewer, and it’s always a bit wistful when someone leaves the fold. I was looking for a refrigerator to use for lagering and found someone ready to let one go. He was a brewer, too, and he’d already fit the thing with taps and handles. *Score*, thought I, *maybe he’s upgrading. Maybe he likes the build-out as much as*

the end result and makes a hobby of it. Plenty of homebrewers are tinkerers, too. But, as it happened, he was retiring from the craft, and like the signs say, everything must go.

The man showed me into a spacious and immaculate garage and walked with me to the fridge. It hummed. It was large, it was quiet, and it was clean. He opened the door. Inside sat a lone sixtel keg, clean and unlabeled.

“I’ll give you that keg with the fridge if you want it,” he said. “I think it’s probably about half-full, still.” →

"What's in there?" I asked.

He considered. It was not meant to be a trick question, but it seemed to stump him.

"It might be a schwarzbiere," he said. "I guess. But it's a big one." He drew off a taste of it, not so much for me to sample his wares as to see that the taps were in good working order. He handed it to me, and I sniffed, as one does.

"Oh, wow," I said. It was reflexive—I was genuinely wowed. The thing was evocative. It was conjuration and summoning in a glass. It cast a glamer of deep, snowy woods, of walking through them with breath frosting and of returning home again. It had a nose like Black Forest cake. Candied cherries, cocoa, a hint of praline, roast, pine, a hint of distant coffee, a slight

though fulsome alcohol warmth, and cold water drawn from a rocky stream.

Then the taste. I don't know that I've ever felt so schnookered by any other culinary experience. It was as if I'd sipped the shadow of everything good on the nose. Goodbye, candied cherries; hello, vintage fruitcake in a cabinet. Goodbye, roast and pine; hello, ash. Goodbye, Black Forest cake; hello, borscht.

I bought the fridge, but that was the last I had of the might've-been-a-schwarzbiere. Long may its memory live.

My intention in bringing you all along for the schwarzbiere séance is not to cast aspersions upon anyone else's brew or brewing. It's to illustrate a few important points: off flavors exist. They are out there, like wolves at the door. Some will be apparent at once. Others

will lie in wait to trick you. Others will appear with time—think of it as the opposite of maturation. And once they're there, they're there. They run the game. There's not much to be done.

Once I made a pot of ginger carrot soup and dumped the lid off the salt cellar into the pot along with every grain of salt. We let it all settle to the bottom and skimmed what soup we could off the top. And it tasted like pure, unmitigated salt. There was nothing to be done. It takes some care, but it's far easier to sidestep those sorts of mistakes than to attempt any sort of effective correction. What I'd like to offer here is a basic primer on the most common off flavors, given in the form of a how-NOT-to guide.

Off flavors are myriad. They run the gamut from ash to cabbage via backroads paved with cardboard, plastic, and elastic. [Sounds wretched, doesn't it?] Their number is legion, and I do tend to go on a bit. For the sake of brevity and of decency, we'll rein this in and keep our focus on the horrible half-dozen: acetaldehyde, diacetyl, phenol, dimethyl sulfide (DMS), oxidation, and skunk. [And if you saw skunk on that list and wondered if I'd slipped that in to make sure everyone was reading carefully, you're lucky. Some among you will remember green bottles gone over to the dark side.] We'll take it from the top:

OFF FLAVOR	TASTES LIKE	THE CAUSE	THE PREVENTION
Acetaldehyde	Variations on the theme of apples, pumpkin guts, latex paint	Oxidation, yeast health, temperature issues, prematurely racking off yeast	Mind temperatures and transfers, take care of your yeast, and give it time (but not too much time). Sanitize.
Diacetyl	Variations on the theme of butter	Contamination, yeast health, and/or temperature issues (especially a low fermentation temperature)	Sanitize rigorously, mind your temperatures, and consider implementing a diacetyl rest.
Phenol	Medicine, plastic, elastic, bananas, smoke, cloves	Contamination, yeast health, chloramine in your water, and/or temperature issues (especially an overly warm fermentation)	Sanitize meticulously, mind your temperatures, and give your yeast a hand—consider a yeast starter.
Dimethyl sulfide (DMS)	Cooked vegetables, i.e., corn, cabbage, celery; or, infrequently, shrimp	SMM conversion to DMS in the boil. Can also be formed by some yeasts during fermentation, depending on temperature, pH, beer, and vessel.	Use malt with less SMM; conduct a long, rolling, uncovered boil; reduce time from flameout to pitching. Support yeast with nitrogen and proper fermentation temperature.
Oxidation	Possibly sherry; more likely variations on the theme of paper	Thermal aging, or, most likely, too much oxygenation at the wrong time	Aerate carefully and on purpose, and never after primary fermentation is complete. Slow down. Sanitize attentively on general principle.
SKUNK (MBT)	Cat, skunk, rubber	Thermal aging, light exposure	Darkness. Sanitize with great gusto and wild abandon as a matter of course.



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ACETALDEHYDE

Acetaldehyde is an intermediary in yeast's conversion of glucose to ethanol during fermentation. The good news is, if you're working with healthy yeast in sufficient supply, the yeast will re-consume the acetaldehyde, too. But if your yeast is weak, exhausted, overwhelmed by a high starting gravity, or insufficient in number, then it can't properly finish the job and clean up after itself.

Lingering acetaldehyde can present as a "twangy" note reminiscent of green apple, cider, or rotting apples. Some tasters perceive it as latex paint or pumpkin guts. In some lager styles, subtle acetaldehyde may not be considered a flaw, but most of the time the taste and aroma of apples is undesirable. But you know what they say about an ounce of prevention. Fortunately, as is the case for most off flavors, there are simple steps you can readily implement that will greatly reduce the chances of this off flavor appearing in your beer.

First, as should always be the case, make sure that your sanitation practices are beyond reproach. Secondly, take appropriate steps to baby your yeast. Making a yeast starter—especially if you're brewing a higher gravity beer—is a good way to ensure that you start out with an abundant yeast supply. Next, maintain a proper fermentation temperature. Don't ferment too hot or too cold. Consider that for most of us, 60°F (16°C) feels cool, and 80°F (27°C) feels very warm, especially for indoor conditions. Many strains of yeast are even pickier.

Additionally, acetaldehyde can be produced by oxidation. You can read more in a moment about that phenomenon, which produces its own set of off flavors even without the appearance of this one. Lastly, sometimes aging can help. Make sure you allow enough conditioning time for the yeast to finish its job.

DIACETYL

Diacetyl is produced indirectly by yeast during fermentation. Like acetaldehyde, it is usually re-consumed. It's also worth noting that mild diacetyl can be OK in small amounts, particularly in some styles of ale from the British Isles and in Czech lagers. However, in most instances perceptible diacetyl is considered a flaw.

It is noticeable as flavors and aromas of butter and butter-like substances, including butterscotch, fake "movie popcorn" butter, and even rancid butter. High concentrations of diacetyl are most often caused by issues with yeast and/or temperature. Here, too, these issues are easy enough to prevent and essentially impossible to remedy once you can smell and taste diacetyl in your finished beer.

As always, make sure to use fresh, healthy yeast in an appropriate amount when you pitch, as weak, mutated, outdated, or overworked yeast can often be responsible for butter bombs. Do not rush your fermentation time or make the mistake of racking off the trub too soon, as the yeast will need time to do its work.

Extended low fermentation temperatures are often the culprit when excessive diacetyl is present; as such, a short rise near the end of fermentation time can help to eliminate this problem by reinvigorating the yeast and encouraging it to consume and convert lingering diacetyl. This is a common step for many brewers and is known as a diacetyl rest.

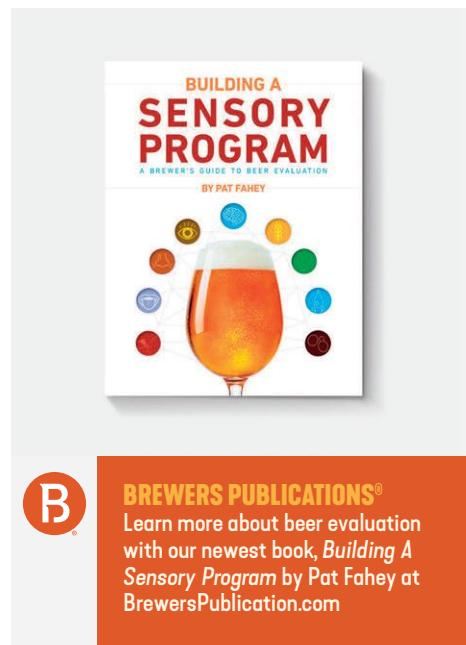
Lastly, heat accelerates the production of diacetyl. This isn't a bad thing if you deliberately implement a diacetyl rest to allow the yeast to take care of it, but it is a problem if you believe fermentation to be complete and rack off the yeast or package prematurely. You can check progress by pulling a sample and heating it to around 150°F (65°C) for 10 minutes, allowing it to cool back down, and comparing against an unheated sample. If you detect butter in the heated sample, your beer needs more time.

PHENOL

I'm sure it will come as a great surprise, but yeast naturally produces phenols as byproducts of fermentation. Weak, overtaxed, and/or insufficient yeast will produce more. Phenolic compounds most often present as medicine, elastic bandages, cloves, or smoke. Some yeasts, particularly Belgian strains, are more prone to producing phenols than others.

Phenols are more likely to develop in a too-warm fermentation, and they're virtually guaranteed with *Brettanomyces* contamination—Brett is notorious for creating notes of sweat, smoke, and bandages. Again, take care of your yeast and mind the temperature.

Finally, unwanted phenols are likely to dominate if your water is treated with chloramine. You can remove chlorine by letting your brewing water sit out for 24 hours or by pre-boiling it for 15 minutes, but eliminating chloramine requires filtering your water or treating it with Campden tablets.



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I was so, so proud of my first-ever all-grain, brewed-by-myself, outdoors-in-my-very-own-giant-brew-kettle batch. I'd been forced to do my first batch indoors without a brew kettle, in a not-quite-big-enough pot straddling two of the four burners on the stove. Let me tell you, I noticed a lot of steam coming off. (It's a bit of a pity that I didn't notice it wafting into the next room and coalescing where it wasn't wanted, but nevertheless.)

Afterwards, I reasoned that my net output could be improved if I retained more of the steam. Enter the roll of aluminum foil. For batch number two, I made the bold decision to cover the kettle. *Why doesn't everyone do this?* I wondered.

Let me tell you why everyone doesn't do that: the steam coming off your kettle is chock-a-block full of DMS.

The expurgated version of the science behind it is this: just prior to malting, barley is germinated. The germination produces a compound called S-methylmethionine (SMM). During kilning, some of the SMM is removed. The longer the kilning, the darker the roast, the less SMM. Hence, very light malts—cf., the Pilsner malt I used as the base for my bière de garde—retain more SMM than darker malts. And when SMM is heated (as during the mash or the lead-up to the boil), it breaks down into DMS.

The good news is, a good boil will boil it away. The bad news is, a low boil, a short boil, a covered boil, or a long cool-down can cause DMS retention. Most people have a very low perception threshold when it comes to DMS, too. And beer that tastes like cooked vegetables is nearly always unappealing.

DMS can also be produced by bacterial contamination, so quickly cool wort and pitch yeast. More often, though, the fault lies in the boil.



What's the problem with oxygen? We need it to live, after all, and so does your yeast. Isn't aerating your wort a good thing? The short answer is yes—yes, it is, but to all things there is a season. Aerating appropriately cooled wort just prior to pitching will help boost yeast activity, but introducing oxygen when the wort is still hot and/or when fermentation is complete will produce a host of off flavors including paper, wet cardboard, cucumbers, or just plain stale.

At best, oxidation may produce notes of sherry, and this may not be terrible if you're aging an old ale or a barleywine, but you most likely won't want notes of sherry in your maibock or mild. Of course, it isn't oxygen that you're smelling or tasting. There isn't universal agreement on the point, but some studies have indicated that the chemical culprit responsible for making beer taste like newspaper is trans-2-nonenal, now more commonly known as (E)-2-Nonenal.

So, how do you avoid it? Paradoxically, under-aerating before pitching can also contribute to oxidation. So *do* aerate, but only when the wort is cool. And don't do anything to introduce oxygen after primary fermentation is complete. Keep your airlocks full, as it isn't just wild yeasts and bacteria that you want to keep out. Don't go fast and loose with your transfers. Rack slowly. No splashing, no pouring, no dumping.

When you bottle, don't leave too much headspace. Fun trick—if you tap the neck of the bottle with a quarter, it will foam and help displace some oxygen!

Finally, keep your beer cool. Thermal aging can accelerate and amplify the effects of oxidation, so always store finished beer in a cool, dark place.



Some would say that I'm saving the best for last because some people claim to enjoy the smell of skunk. Even so, "catty" aromatics and odors of skunk and/or rubber are a flaw. Beyond "skunked," the common name for this condition is light-struck, and light is indeed the offender. For once it's not the yeast! (Well, maybe the yeast is guilty of aiding and abetting.)

Specifically, ultraviolet (UV) light causes the isohumulones from boiled hops to react to hydrogen sulfite produced by the yeast and to, in turn, produce the quintuple-hyphenated horror known as 3-methyl-2-butene-1-thiol, or MBT for short. This compound is an example of a mercaptan, which is indeed the same type of chemical produced by skunks.

There is an easy way to keep the skunk at bay: keep your beer out of the light. The photo-oxidation reaction can be almost instantaneous—in one study, a tasting panel could detect the aromatic effects of an exposure of less than 10 seconds. So, keep your carboys in the dark, and bottle in brown.

Some research has even indicated that MBT can be produced by heat as well as light, especially during thermal aging, and even in canned beer. Just another reason to chill out and have a cold one.

J. K. Bywaters is an award-winning storyteller, author, and brewer. His work has appeared in print in publications ranging from Holistic Healing magazine to the anthologies of *Bibliotheca Alexandrina*; recently online at resolutegent.com; and on the judging tables of central Virginia's Dominion Cup. He has been telling tales, brewing ales, and tramping about in the woods for some time now, and cordially invites you to follow him on Facebook and Twitter. 

See Best Practices for Eliminating Off Flavors on page 40 →

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- Also suitable for NEIPAs, this yeast will help you to reveal green, herbal and citric notes in your beer



fermentis.com

BEST PRACTICES FOR ELIMINATING OFF FLAVORS:

- **Clean.** This should be obvious, but sometimes it's the most obvious things that trip us up because we assume that, of course, we know that.
- **Sanitize.** Cleaner doesn't sanitize. Sanitizer doesn't clean.
- **Know your water.** If you can pick up on something off in your water, chances are better than 50:50 that you can pick it up in your beer.
- **Consider a longer boil.** Can't hurt. Might help. I boil for 90 minutes most every time. Unless you're unconscionably pressed for time or your top priority is a brew at the lowest end of the SRM scale, there's nothing to stop you.
- **Fully oxygenate wort at pitch.** Metaphorically speaking, your yeast will thank you.
- **Pitch an appropriate amount of yeast.** You don't always need an enormous yeast starter, but even a very modest starter is often better than none at all.
- **Seriously: mind those fermentation temperatures.** Yeast is going to do what it's going to do. Go too cold or too warm at your own risk, but don't blame your yeasts if you take them out of their comfort zone.
- **Don't rack off of the trub before fermentation is complete.** There's a wide berth between mostly done fermenting and really, most sincerely done fermenting.
- **Don't introduce oxygen after fermentation.** You're so close. It'd be a shame to sully your hard work now.
- **Keep it in the dark.** Covers, cans, kegs, and closed doors are your allies. Green, blue, and clear bottles are not.
- **Keep it cool.** "Cellar temperature" is not the same thing as "closet temperature."

ROCK-SOLID RECIPES

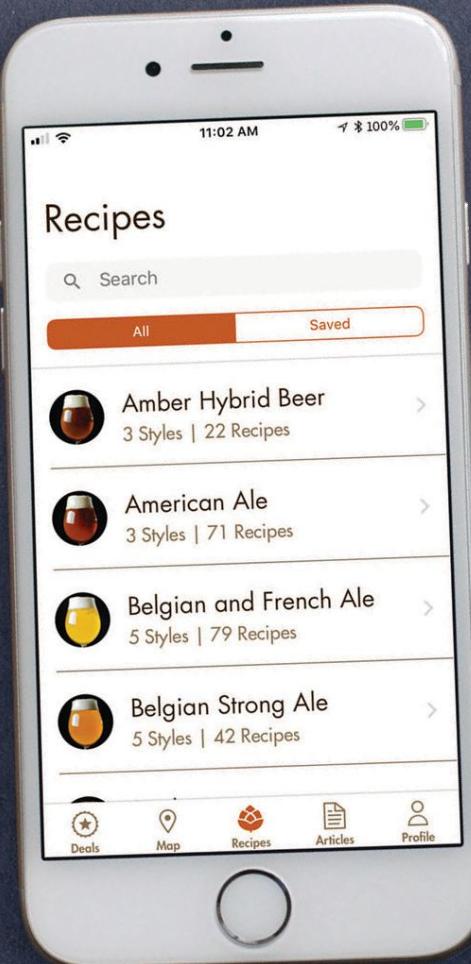


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Editor's Note:

Throughout the text you'll see dates in parentheses to indicate when the Maltose Falcons hosted a particular brewery for happy hour.

Turning the Lockdown into Epic Learning Happy Hours

By Jay Ankeney

“This is the American Light style lager of my dreams.”

These words popped into Zoom chat windows on desktops, laptops, and phones in front of participating members of the Maltose Falcons homebrew club on December 11, 2020. It was the 32nd in the club’s series of weekly Falcons Are Your Friends lockdown happy hours, organized in response to all of Southern California having been forced behind closed doors in response to the COVID-19 pandemic.

In all, 38 members of America’s oldest homebrewing society took part in an online group video conference in which we sampled the same beer that MadeWest Brewing of Ventura, Calif., calls Ventura Light, while sitting at home in COVID-19-safe seclusion. “Malty, rich, smooth, clean finish,” the text continued, “and low diacetyl.”

With the club’s then president, Bernard Lebel, and its officially elected “grand hydrometer” (i.e., technical guru), Drew Beechum, leading the discussion, this was the same two-hour curated tour through the best in L.A.’s craft brewery offerings that had been going on every Friday evening since April 2020.



Bernard Lebel, president of the Maltose Falcons from Oct. 2019 to Dec. 2020. Credit: Bernard Lebel

A BRIEF HISTORY OF THE MALTOSE FALCONS

The Maltose Falcons homebrew club was founded in 1974 by Merlin Elhardt, who wanted to produce delicate German-style lager beers at home. He adopted all-grain brewing and yeast culturing before most people knew such techniques existed. Club members actively supported efforts in 1978 to legalize homebrewing and were invited to the initial signing of the Bates bill to legalize homebrewing in California. That bill was eventually signed by Governor Brown on July 19, 1978. The club was also instrumental in working with California Senator Alan Cranston to submit his bill that legalized homebrewing at the federal level. In April 1979, the Falcons organized the first annual Springfest competition, which in 1987 was moved to May and renamed the Mayfaire. The club also hosts an Oktoberfest and the Los Angeles County Fair Homebrew Competition. In 1989, the Falcons were awarded Anchor’s California Brew Club of the Year and followed up in 1994, 1994, 1996, 1999, 2004, 2007, 2010, and 2014! The club also won the AHA’s Radeガst Award in 2015. The Maltose Falcons continue to be recognized as one of the premier homebrewing clubs in the country, noted for teaching beginners and producing outstanding quality homebrewed beer. John Daume, who runs the Home Wine Beer and Cheesemaking shop in Woodland Hills, generously sponsors the Falcons and provides space for a clubhouse, pilot brewery, and barbecue pit.

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Speaker icon

Video camera icon

Microphone icon

Phone icon



Drew Beechum, grand hydrometer.

Credit: Jay Ankeney

Each week, the Maltose Falcons gather in online camaraderie with two explicit goals in sight: (1) expose fellow Falcons to the widest possible variety of craft beers found in the greater Southern California area and (2) lend some much-needed financial support to the best of L.A.'s sales-starved craft breweries.

Pandemic Confusion

During the time of COVID-19, Los Angeles's breweries were hit by the double whammy of a slew of restrictive ordinances passed by the State of California and the City of Los Angeles's own Board of Health's limitation on brewers' ability to sell their wares. Starting March 14, 2020, temporary opening protocols and repeated shutdown orders confused the situation throughout summer, autumn, and the crucial Thanksgiving through New Year's season, including Super Bowl Sunday, until finally allowing breweries to recommence outdoor sales on January 25, 2021.

All of these crippling financial squeezes on breweries came even though statistics showed outdoor dining was responsible for only 1.4 percent of new infectious COVID-19 cases, and in a succession of hearings the County Board of Health failed repeatedly to substantiate their claims. But their draconian dicta had teeth.



Mike Resar, then publicity director.

Credit: Mike Resar

David Chaney, head brewer at Pedals & Pints in Thousand Oaks (Oct. 30, 2020), said that when their owner saw bars and restaurants at the nearby Westlake Village shopping center freely serving alcohol on site, he decided to follow suit on January 4. The state's Alcohol and Beverage Control agents were knocking on their door within a couple of hours.

This hit the bottom line for many breweries. According to the L.A. Brewers Guild, "2020 brought on immense financial losses for our breweries with a majority of membership reporting revenue losses upwards of over 70 percent of their annual projections." Recognizing the common heritage homebrewers have with craft breweries, the Falcons Are Your Friends lockdown happy hour was born.

The idea was actually conceived by Kim Resar, wife of Mike Resar, the club's publicity director at the time, who proposed getting four-packs from breweries and distributing them to members, who could then discuss them during a Zoom call to expand our tasting perceptions. At the same time, we could bring some unexpected sales to our pro brewing colleagues. After all, we share the same heritage. We are of them, as they are of us.

Together Apart

The idea has evolved into a spectacular success. As of the end of March 2021, there have been 45 weekly happy hours, resulting in 2,253 four-packs sold, which infused \$42,490.90 into the coffers of local craft brewers.

The greatest single order was 76 four-packs, which were transported all the way from San Diego when we hosted Pure Project Brewery (March 25, 2021). The highest single week's sales total went to The Bruery (Feb. 12, 2021) when they offered



Kim Resar conceived of the "lockdown happy hour" project.

Credit: Mike Resar

a 750 mL bottle of barrel-aged Crème Bruelay barleywine as an add-on to orders, bringing their delivery total to \$2,706.

The primary benefit to the members of the Falcons is to expand participants' taste horizons in a massive group-learning experience. Two factors are key to making this happen.

The first is having everyone sample the same beer at the same time. A few weeks prior to a given happy hour, when we select the brewery to host, we make arrangements to purchase a given number of four-packs from that brewery, usually as 16-ounce cans. We try to keep it under \$20 for a four-pack so the experience is affordable for all who want to participate.

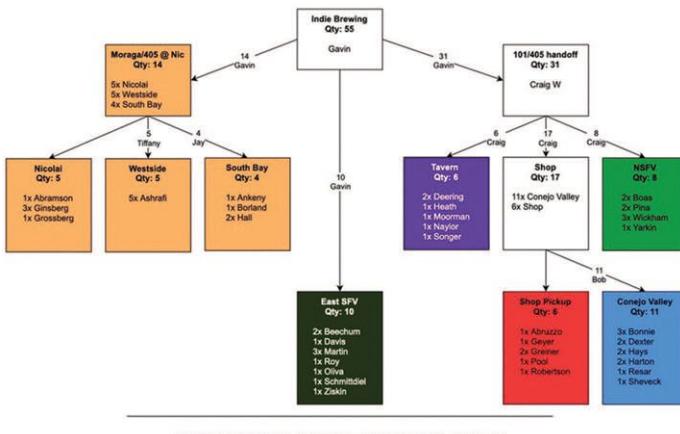
Then, the week of each event, members sign up and pay for their beers on the Falcons' website and the gears start to turn. That's when the Maltose Falcons' awesome Pony (Keg) Express delivery system comes into play.



Pony (Keg) Express drivers, left to right:
Tiffany Ashfrary, Gavin Martins, Craig Wickham.

Credit: Tiffany Ashfrary (selfie)

The Pony (Keg) Express is an amazingly complex team of drivers who convey four-packs to the doorsteps of members throughout SoCal. It's sort of a relay race



Pony (Keg) Express delivery block diagram.

Credit: Gavin Martin

handoff in which the lead rider brings all the beers into town from the guest brewery—in this case Indie Brewery Co. of Los Angeles (Dec. 18, 2020)—to collection centers where volunteer Pony (Keg) Express drivers take them to other distribution points until they cascade their way to members' individual addresses. The process has become so smooth that the run for Lincoln Beer Co. of Burbank, Calif., (Feb. 19, 2021) was cranked out in just about 90 minutes.

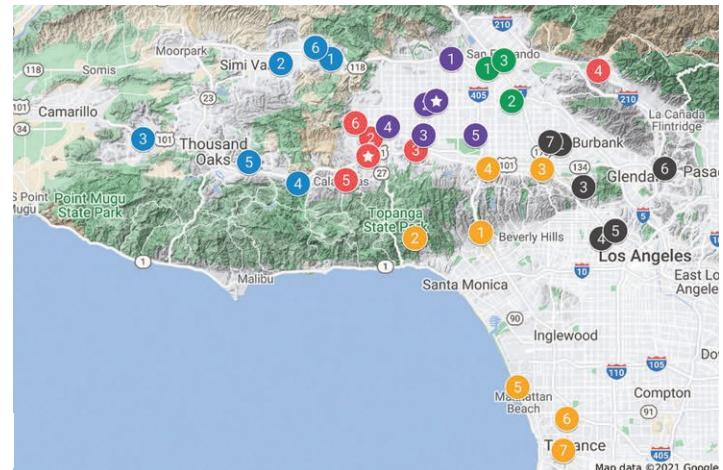
There is obviously no actual keg in the Pony (Keg) Express, but this club loves wordplay. After all, our name is derived from the legendary 1930 noir novel (or is it the 1941 Bogart movie?). Furthermore, at any time our mascot, the top competition prize, or whoever is leading a Zoom meeting may arbitrarily be called Hashielli Dammet, and everyone gets the joke.



Members of Project Barley Brewery.

From left to right: Rives Borland, Brent Reger, Cosey Bond.

The second factor guiding this rarefied learning opportunity is the ability to speak directly with a brewery's head brewer or, sometimes, a knowledgeable owner. Context comes during an online interview guided by a club MC sufficiently filled with beer knowledge and lore. For the Falcons, the discussion's curator is Drew Beechum, a panjandrum of brewing and homebrewing factology who has authored six books on the subject, co-hosts the *Experimental Brewing* podcasts, and regularly attracts



From the mountains to the sea: destinations for the Pony (Keg) Express.

Credit: Gavin Martin

standing-room-only attendance at his Homebrew Con presentations.

Drew's approach to each session is geared to keep everyone at ease with his self-deprecating sense of humor while covering the main points of malt, water, hops, yeast, and brewing technique. Given four beers per session, about 30 minutes is dedicated to each.

"As we move through the beers," Drew explains, "I explore the natural details that homebrewers will care about ('How did you make this?' 'What's in that?'), try to tease out from there what common threads there are in the brewery, and shine a spotlight on anything that stands out to me."

The Zoom gallery view during the video conference can easily exceed 45 Falcons members, friends, and family. The vast majority are BJCP ranked, and a healthy contingent have founded their own commercial breweries. Consequently, the observations and feedback they add to Drew's interrogation keep the sessions breezy and pithy, at a high kräusen as it were.

Of course, not all guest breweries knew what to expect. As member James (Jimbo) Moorman recalls, "In the beginning of the happy hours, it was humorous to see the brewer who thought he was just going to meet with a bunch of 'Joe-six packs' unexpectedly get asked what the water profile is or intricacies about their brewing process," he said. "Now the word is out, and they come with spreadsheets and notes."

Tiffany Ashfrary has learned many lessons from the lockdown happy hours. For example, from the Poseidon Brewing Co., Ventura, Calif. (Aug. 7, 2020), "I learned how much it really is art versus science," she said. "They would just dream up something special and then go make it. The motto of the owner during our whole session was 'Just screw it, brew it,' and a lot of their beers came out amazing."



Tiffany Ashfrary helps keep the Pony (Keg) Express on schedule.

Credit: Jay Ankeney

Flights of Fancy Beers

But then there were also other breweries following the other side of the spectrum, with brewers who were keeping it more corporate while still getting the job done. "I remember Santa Monica Brew Works, Calif. (July 24, 2020) has great beer," said Tiffany, "but the brewmaster has little leeway in the recipe or process. Still the beer turns out fine."

Given the Falcons' flare for flamboyance, it's not a complete surprise that the Pony (Keg) Express has taken to the skies. When the Hangar 24 Brewery, headquartered on the Redlands Municipal Airport, was selected for the January 21, 2021, happy hour, private pilot and flying Falcon Gavin Martin offered his FFA Bravo, an aerobatic aircraft built in Switzerland, to make the first leg of the Pony (Keg) Express delivery.

With 64 four-packs and an add-on of 38 750 mL bottles of barrel-aged Slow Roll Belgian-style golden ale, it took two trips to make sure the loads were properly balanced. But he was greeted by Craig Wickham in Los Angeles upon landing, and the beer got distributed on schedule.

"Actually, the best part of the experience for me was talking with Hangar 24's brewmaster Jason Pond," Gavin said. "It was very interesting to see the perspective



Gavin Martin high over Los Angeles (no “beer flight” jokes, please).
Credit: Gavin Martin

of a pro who was head brewer at a global 600,000-barrel outfit in Europe, Brewdog, that is famous for breaking the European tradition with an American-style approach. Bringing him to a small outfit like Hangar 24 was probably a calculated move on the part of the investors. This guy was a superstar brewer at Brewdog, and they gave him carte blanche to come up with beers pushing the envelope.”

Geoff & Vivian Robertson were also impressed with what flew in from Hangar 24. “We’ve learned that the oxidation that occurs either in the casks or in the bottle will usually be tasted as a cherry, raisin, fig, or sherry flavor on top of the original feel of the base recipe,” they wrote. “As a result, it was helpful to notice with the help of all the other homebrewers in the Zoom conference that the Barrel Roll Belgian-style golden ale from Hangar 24 was definitely in the cream sherry and raisin categories, and it most likely came from oxidation in the bottle since it only spent about a year in the cask but then seven to eight years in the bottle. Very delicious!”

Ilan Grossberg picked up a taste lesson about consistency from the Hangar 24 happy hour. “They noticed that in one of their signature beers, Betty IPA (a West Coast IPA), even a small change in the



You don't get to see beer strapped in a five-point harness very often.
Credit: Craig Wickham

“

GAVIN HAS SLIPPED THE SURLY BONDS OF EARTH, TROD THE HIGH UNTRESPASSED SANCTITY OF SPACE, PUT OUT HIS HAND, AND TOUCHED THE FACE OF NINKASI.

— WITH A TIP OF THE MUG
TO JOHN GILLESPIE MAGEE, JR.



Geoff Robertson.
Credit: Geoff Robertson



Vivian Robertson.
Credit: Geoff Robertson



Craig Wickham greets Gavin Martin landing at Whiteman Airport with a plane full of beer.

Credit: Joanne Martin

grain bill was picked up right away by their customers,” Ilan pointed out. “It’s part of the duopoly between brewer and consumer, and during the discussion it became apparent that the Falcons members felt if a major change was to be made in the flavor profile, they expected a comparable change in the name. Say, Betty 2.0, for example. It was fascinating how loyal knowledgeable drinkers are to the beers they love.”

Learning from the Pros

Among others, interacting with L.A. Aleworks from Hawthorne, Calif. (June 19, 2020), inspired Andrew Ziskin to improve his use of *Humulus lupulus*.

“One of my favorite aspects of these happy hours is getting to ask the brewers about their dry-hopping techniques and digging for some real specifics,” Andrew said. “It is interesting to hear all the different methods they employ to extract the flavor and aroma they’re looking for by adjusting timing, temperature, how long the hops are left on the beer, recirculation/rousing, or even leaving the tank under pressure or not … and then being able to taste those differences in the finished product.

Michael UpdeGraff considers himself fairly new to homebrewing, although he’s



Jason Pond with a Barrel Roll Belgian Style Golden Ale. Jason and Hangar 24 are working a lot with kveik yeast.



Ilan Grossberg is the new president of the Maltose Falcons.

already built an all-grain brewing stand. But it is always inspiring to see how novices absorb the fire hose of information that comes out of opportunities like these Zoom sessions.

"I've learned a tremendous amount from happy hours such as the Green Cheek Beer Co., from out in Orange, Calif. [Jan. 15, 2021]," UpdeGraff said. "Two things I didn't realize affect flavor as much as they do are water and yeast. I never took into account of [sic] how different yeast strains will affect the flavor of a brew. I took it for granted it was just the grains and hops. Also, just like the yeast strains affecting taste, I've been amazed at how detailed a water profile can be and how important it is to the taste of your beer."

Craig Wickham was so enthralled by what he had received from these weekly sessions that he wanted to acknowledge specific guests of various lockdown happy hours. "It's what I look forward to every Friday," Craig began. "It was Rives Borland from Project Barley in Lomita, Calif. [Dec. 4, 2020] who really went into depth about how diacetyl is one result of hop creep, and



Jason with Betty IPA version 1.0.



Andy Ziskin is one of the club's confirmed hop heads.

Credit: Andrew Ziskin

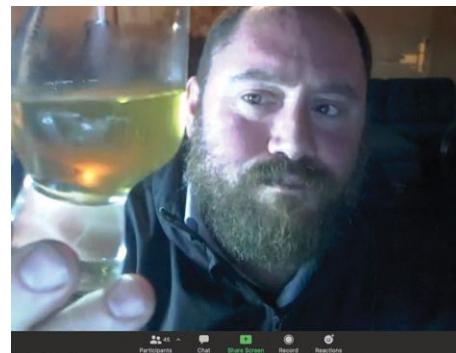
how he deals with it in relation to the timing of the hop addition and the temperature of the wort during hop contact."

He was also impressed with the way Matt and Sarah Luker from Transplants Brewery in Palmdale, Calif. (Nov. 13, 2020), shared their inspiration and execution of a sweet potato ale with nutmeg and thyme called Ocarina Of Thyme.

And it was a revelation for Craig the detailed preparation with which Kris Parker of Third Window Brewing in Santa Barbara, Calif. (Oct. 23, 2020), described the painstaking (spoiler alert: labor intensive) measures that were employed to get just the zest and none of the pith off the incredible number of oranges needed for their seasonal offering of Walkabout Stout.

"The amazing orange presence in this stout really combines so well with the chocolate and vanilla to hide the high ABV," he recalled.

Nicolai Abramson added, "I thought the happy hour with brewmaster Levi Fried at the Long Beach Beer Lab in Long Beach, Calif. [Jan. 30, 2021], was one of the most interesting, if offbeat, that we had."



Levi Fried from Long Beach Brewing Labs.

Levi is a medical doctor who practiced in Israel until he decided to open a combination brewery and bakery with his wife in Long Beach, where they could experiment with their iconoclastic ideas of turning grain into nourishment.

Levi himself said, "I'm just a homebrewer in a larger kitchen," and he proved it by making saison beer and California sourdough bread with the same yeast. Both came out so delicious that most of us ordered a full loaf along with our four-packs.



Michael UpdeGraff with his gravity-fed all-grain system.

Credit: Michael UpdeGraff



Craig Wickham, owner of California Beverage.

Credit: Craig Wickham



Nicolai Abramson enjoying one of his brews on tap.

Credit: Nicolai Abramson

Brew
This!



Em Day's Pale Ale

American pale ale

Recipe courtesy Rives Borland, head brewer and founder at Project Barley Brewery.

Em Day's Pale Ale is a modern West Coast-style hoppy pale ale with just enough malt complexity to make it interesting as a pale ale, but dry and light enough to allow for high drinkability and crispness, with the citrus, berry, and tropical hops shining through.

It was a collaboration with Emily Day (emily-day.com), who is one of the top-ranked beach volleyball players in the world. She helped Project Barley brew the pilot batch of this beer, and some of the proceeds of the sales of the beer go to her charity of choice, the Allison Dewart Memorial Scholarship Foundation (admsf10.org).

Batch volume: 6 US gal. (22.7 L)

Original gravity: 1.049 (11.9°P)

Final gravity: 1.010 (2.6°P)

Efficiency: 70%

Color: 5 SRM

Bitterness: 38 IBU

Alcohol: 5.1% by volume

MALTS

3 lb. (1.36 kg) two-row pale malt

3 lb. (1.36 kg) Pilsner malt

3 lb. (1.36 kg) Maris Otter malt

1.25 lb. (567 g) light Munich malt

10 oz. (284 g) white wheat malt

4 oz. (113 g) honey malt

HOPS

0.14 oz. (4 g) Magnum, 12% a.a., FWH

1.2 oz. (34 g) Citra, 13.4% a.a., whirlpool 20 min @ 208°F (98°C)

1.2 oz. (34 g) Galaxy, 15.9% a.a., whirlpool 20 min @ 208°F (98°C)

1.2 oz. (34 g) Mosaic, 11.6% a.a., whirlpool 20 min @ 208°F (98°C)

1.8 oz. (50 g) Citra, 13.4% a.a., dry hop 2 days

1.8 oz. (50 g) Galaxy, 15.9% a.a., dry hop 2 days

1.8 oz. (50 g) Mosaic, 11.6% a.a., dry hop 2 days

GOVERNMENT WARNING: (1) According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. (2) Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery, and may cause health problems.

Brewed by Project Barley, 2308 Pacific Coast Hwy, Lomita, CA 90717

16 FLOZ. 5.1% ABV

EM DAY'S PALE

BREWER OWNED AND OPERATED

Project Barley's can label for Em Day's Pale Ale
Credit: Project Barley brewery

YEAST

Fermentis SafAle US-05, White Labs WLP001 California Ale, Wyeast 1056 American Ale, Omega OYL-004, Imperial A01, or any clean American ale strain

WATER

Ca 75 ppm, Mg 5 ppm, Na 0 ppm, Cl 50 ppm, SO₄ 125 ppm, HCO₃ 0 ppm

ADDITIONAL ITEMS

1 tablet Whirlfloc @ 15 min
yeast nutrient (optional) @ 15 min

BREWING NOTES

If using liquid yeast, prepare a starter in advance of brew day with one yeast pack, or simply use 2 packs with no starter.

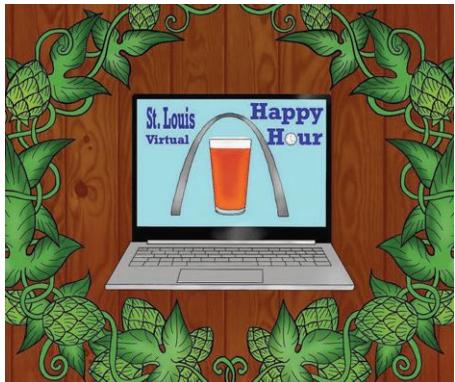
Single infusion saccharification rest at 152°F (67°C) for 60 min. Add first-wort hops to kettle and collect 7 gal. (26.5 L) of 1.042 pre-boil wort. Boil 75 minutes, adding Whirlfloc and, optionally, yeast nutrient 15 minutes before flameout. Add whirlpool hops and whirlpool 10 minutes. Let wort rest a further 10 minutes before chilling wort and racking to fermenter.

Oxygenate and ferment at 68°F (20°C). When specific gravity is within 10 gravity points of anticipated terminal gravity, add dry hops and allow temperature to rise to 72°F (22°C).

After two days of dry hopping, bottle or keg with 2.6 vol. (5.2 g/L) CO₂.

EXTRACT VERSION

Replace the two-row, Pilsner, Maris Otter, light Munich, and white wheat malts with 3.25 lb. (1.47 kg) Maris Otter liquid malt extract (LME), 3 lb. (1.36 kg) Pilsner dry malt extract (DME), 12 oz. (340 g) Munich DME, and 8 oz. (227 g) wheat DME. Steep the 4 oz. (113 g) of honey malt for 20 minutes in 160°F (71°C) water. Remove grains, top up with reverse osmosis water (add 2–3 g gypsum) or carbon-filtered tap water, and proceed with the boil as described in the all-grain version.



St. Louis Brews Facebook logo.

Credit: Ryan Kriesch

As an example of his unique approach to making beer and bread based on his background in microbiology, Levi told us, "When making the yeast starter for our sourdough bread and saison beer, we began in 2016 using apricots and grapes grown on backyard fruit trees."

After all these happy hours with craft brewers, it's worthwhile harvesting the reflections from Drew Beechum himself.

"Some of the general trends I've noticed include that everyone (or just about everyone) has a hazy or two or three now," Drew submits, "but almost every one of the brewers we've talked to aren't personally fans of that style, but it pays the bills."

"There are more and more Pilsners and Mexican lagers here in L.A. than I saw even two years ago. That may be because the Weihenstephan 34/70 lager yeast strain rules the roost in that style category. Maybe as a result there are far fewer 'fake' lagers than I expected."

"Over time, all of our West Coast IPAs have gotten both paler and less directly bitter in response to the hazy trend."

A Bright Future

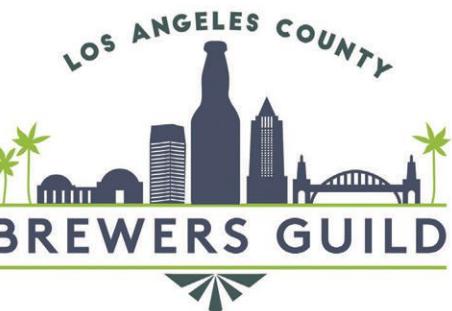
It's rewarding to see that the idea of happy hours that inform homebrewers while also helping local breweries is already spreading. Ryan Kriesch has been participating in the Maltose Falcons' online Zoom sessions all the way from St. Louis, Mo. Although active in the St. Louis Brews club, among others, Ryan said he has adapted the core idea by inviting multiple local St. Louis clubs to join a Falcons-style happy hour on a Facebook page at facebook.com/STLVirtualHappyHour.

"In our own club here in St. Louis, we had 57 orders for six-packs in February and, with five other clubs participating, we hope it's going to grow," he said. "I record the sessions and post them on our Facebook page and Facebook Live so it's easily accessible."



Author Jay Ankeney brewing the same porter that took best of show at the 1988 L.A. County Fair.

Credit: Jay Ankeney



Credit: L.A. County Brewers Guild

our city hearings to help get us open in the first place, to continuing to organize and advocate for us during our multiple pandemic challenges. I am constantly in awe at the level of engagement, support, and friendship this community showers us with day in and day out."

Jay Ankeney is a member of several Southern California homebrew clubs, including the Maltose Falcons since the mid '80s and the Strand Brewers Club since the '90s.

NEW RECIPES

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ROI

Return on Investment for the Homebrewer

Getting the Best Value out
of Your Homebrewery

By J.B. Zorn





A Working Definition

Homebrewing ROI is a ratio of a homebrewer's investments (i.e., time, cost, effort) to the effectiveness of their goals and perceived value.

One of the first questions many of us hear from those new to homebrewing is "Does homebrewing cost less than commercial, off-the-shelf beer?" or "How good is your homebrew compared to commercial beer?" The short, unsatisfying, and overly simplistic answer is "It depends."

Perhaps a better way to address this is to reframe the question and ask, "What is the return on investment (ROI) for the homebrewer, from a true cost, quality, and holistic perspective?" And, as we progress on our journey of learning the art and science behind the hobby, how can we improve the value and quality of our homebrew and homebrewery?

There is no shortage of philosophies, best practices, tips, and techniques to improve homebrew, but I'd like to offer a framework that considers the investment of cost, time, and creative choices as factors for improving the homebrewer's return on investment.

So, what is ROI?

In business, it's common to hear a focus on financial ROI, especially when pitching a new idea or solution to senior decision makers. It goes something like this: If we invest X dollars here, we think it will provide a Y percentage return over a set period of time. This makes sense if we are purely focused on maximizing profits, but

as homebrewers we should be focused on maximizing value and intrinsic factors in honing our craft.

To get started, think about which aspects of homebrewing drive your passion. While some folks love the creativity of recipe design and novel creations, others may find joy in perfecting a beautifully classic but simple German Pilsner. Our individual values or goals may be subjective and will likely change over time, but the ROI thought process is universal.

With that in mind, I suggest we broaden our scope beyond just dollars and cents to look at homebrewing ROI in terms of these characteristics:

- Brewing ingredients and styles
- Equipment and process
- Creativity and collaboration

Before we jump in, let's acknowledge that great homebrew can be made by the newest of brewers with the simplest of setups and processes. Indeed, the quality and diversity of today's homebrewing ingredients and equipment are very high and continue to expand, making some trade spaces less about price versus quality than about price versus performance, ease of use, and any desired special capabilities and characteristics. Likewise, each new investment likely comes with a good deal of trial and error, so we shouldn't discount the simple joy of learning and sharing in the journey. →

Brewing Ingredients and Styles

"More Bounce to the Ounce"

—Song title by funk band Zapp

The most fundamental and routine “investments” or choices that any homebrewer makes are the classic three raw ingredient building blocks of any new beer: grains, hops, and yeast. Intentionally planning groupings of upcoming recipes and bulk buying grain and hops is an easy way to maximize economies of scale and cost-focused ROI.

BREWING INGREDIENTS & STYLES ROI

Factor	Investment/Choice	Return/Reward	Overhead/Resources	Notes
Hops	Bulk buy (0.5-1 lb.) vs. 1-2 oz.	25-50% or more cost reduction; flexibility of on-hand ingredients	Freezer space and vacuum bags	Using lower-cost varieties for bittering and flavor; using reduced quantities of higher alpha or less unique hops in relevant styles
	Educated/intentional hop usage			
Grain	Bulk buy (10-55 lb.) vs. 1 lb. increments	10-33% cost reduction for base malt; flexibility of on-hand ingredients	Airtight container(s) and grain mill	Using less unique and novel grain choices (i.e., 2-row pale vs. English Maris Otter for IPA)
	Educated/intentional grain usage			
Yeast	Harvest/reuse	Up to or beyond 100%. Cost reduction depends on number of reuses (2-5 times in my experience).	Clean, sterile containers and cold storage space	Longevity and quantity; Multiple batches and higher cell counts per single pitch
Style & Recipe	Lower OG (ABV per malt quantity) and reduced hop quantities (IBU)	Optimize cost per glass; quantity per ingredient	N/A	Focusing on less raw ingredient cost can save considerable money and also provide great value when compared to typical commercial craft beer cost
	Focus on yeast-driven flavors and styles (i.e., non-neutral American/English)	More diverse and unique beer styles with same base ingredient cost	May reduce ability to harvest or reuse "house" yeast	Focusing on relatively fixed cost of yeast to make increasing unique or less accessible (import) styles (i.e., saison and American yeast cost the same but are capable of producing drastically different beers)
	Focus on high-cost commercial craft styles (i.e. some imports, \$15-20 four-pack NEIPA)	Guaranteed fresh and significant reduction in cost.	May be difficult to access most unique new hops	Even with disproportionately high cost of new-school hops featured in trendy hazy NEIPAs, these styles don't require unique setups or processes. Homebrews will likely still see cost saving ROI when compared with growing commercial pricing.

Bulk grain can be purchased in 50-pound (domestic) and 25-kilogram (import) bags. It usually arrives unmilled, although sellers are increasingly offering the option of bulk milled grain. Unmilled grain has a much longer shelf life, but it requires the additional one-time investment of storage bins and a grain mill.

Bulk hop purchasing also offers an economy of scale, with common varieties ranging from \$10 to \$15 per pound and more unique varieties commanding \$25 to \$30 or more. The good news is bulk hop purchasing requires no additional investment other than a bit of extra freezer space. Bulk buying also allows the homebrewer to have a supply of basic brewing staples on hand, should an occasion call for brewing up a quick batch. So, first,

consider planning several brew days and recipes in advance—bulk buying grain and hops is an easy-button option to improve your brewing ingredients ROI.

Yeast, the third key ingredient, usually occupies a fraction of recipe cost (\$7 to \$10 for a single pack) compared to grain and hops, but it has an outsized influence on beer quality and flavor. As the saying goes, “Brewers make wort; yeast makes beer.” To get some cost-focus ROI from a single yeast pitch or strain, harvesting your yeast via a properly sanitized container can allow for multiple reuses. Alternatively, you can pursue creative ROI by pitching different yeast strains in different fermenters to experiment with the different flavor profiles from the same base batch of wort.

Putting Style ROI into Practice: Cream Ale and American IPA

Brew
This!



Batch volume: 12 US gal. (45.4 L)

Original gravity: 1.041 [10.2°P]

Final gravity: 1.009 [2.3°P]

Efficiency: 75%

Color: 4 SRM

Bitterness: 15 IBU

Alcohol: 4.2% by volume

MALTS

16 lb. (7.26 kg) Dingemans Pilsner

1.25 lb. (567 g) flaked maize

0.33 lb. (150 g) Weyermann Carahell malt

0.33 lb. (150 g) Caravienne malt

0.33 lb. (150 g) Weyermann Acidulated malt

HOPS

1 oz. (28 g) Cascade, 6.2% a.a. @ 90 min

1 oz. (28 g) Cascade, 6.2% a.a. @ 15 min

WATER

Filtered water with 1 tsp CaSO₄

YEAST

White Labs WLP080 Cream Ale Blend [2L starter]

Charismatic MangoFauna

Cream ale

Recipe courtesy J.B. Zorn.
Label by Nicole Ray (sloeginfizz.com).

ADDITIONAL ITEMS

5 fl. oz. (148 mL) Amoretti mango syrup (keg)

yeast nutrient

Irish moss

BREWING NOTES

Heat 6 gal. (22.7 L) strike water to 163°F (73°C) and mash in grains for a mash thickness of 1.33 qt./lb. (2.8 L/kg). Mash for 60 minutes at 150°F (66°C) and then 5 minutes at 158°F (70°C).

Boil 90 minutes, adding hops as indicated. Chill wort and pitch yeast. Ferment at 68°F (20°C) until specific gravity reaches indicated final gravity.

Thin mango syrup in about ½ cup (120 mL) of water and add to keg when packaging. If bottling, consider sugar content of syrup when calculating priming sugar addition.

ALTERNATE VERSION

Ferment with Wyeast 3522 Belgian Ardennes yeast, with or without mango syrup, to turn this cream ale into a Belgian-style table beer.

Consider three approaches to maximize your style ROI.

- Low original gravity (less than 1.045) and/or low international bittering units (less than 15 to 20 IBU)
- Yeast-driven styles, especially Belgian and other strains with limited craft beer representation
- High-cost commercial craft styles such as NEIPA and other IPAs

American cream ale (BJCP Style 1C) is a fantastic case in point of a low OG, low IBU style. My recipe for Charismatic MangoFauna provides great cost ROI with respect to ingredient cost versus batch size. Even using premium base malt (Dingemans Pilsner), the total cost was \$51 for 12 gallons (45 liters), or 54 cents per pint (473 mL).

Buying base grain and Cascade hops in bulk brought the cost down approximately 11 percent, or \$6.30 from \$58. Without considering costs associated with packaging, brewing energy (propane, electricity, or natural gas), or labor, comparing the ingredient cost of this homebrew to the same quantity of craft beer (assuming \$10 per six-pack), still yields a 76 percent cost savings (\$213 vs. \$51).

Looking toward a relatively “high-cost” style like American IPA (BJCP Style 21A), we see good homebrew value compared to commercial pricing, plus the bonus of guaranteed freshness! My and my brew partner Joe’s recipe, Oceania IPA, features all Australian hops, including the very unique and pricey Galaxy. This recipe has almost a full pound (about half a kilogram) of “special” hops in a 16-gallon (61-liter) batch but only costs about \$105 total or 81 cents per pint. An additional ROI factor to consider is the brew-day time investment. Assuming you have the capacity and equipment (or your brew partner does), brewing 16 gallons takes roughly the same amount of time as brewing 6 gallons. More beer, less time—everybody wins!

Equipment and Process

“Build a little, test a little, learn a lot.”

—Adm. Wayne E. Meyer, known as the Father of the Aegis weapon system

Homebrewing setups and processes naturally build on themselves with time, knowledge, and collaboration, often aided by some additional cash. It's a continuous learning cycle, and not every upgrade is appropriate for all homebreweries, nor should it happen all at once. Real learning and proficiency come with successes and failures built over dozens of batches and years of brewing. It seems like every day sees new homebrew gear releases, including all-in-one electric systems that can help save significant time and space. So, this section will attempt to provide “investments” that could generally apply across the board, acknowledging that everyone's needs are different. Again, none of these are completely necessary to make great beer at home, but they can help save money (over time), improve your time management, brewing precision, and beer quality.

Some who are considering the jump from extract to all-grain may wonder about potential ROI from that choice. While many of these recommendations could apply to any method (i.e., kegs, yeast starters, refractometer), others are heavily focused on all-grain brewing. Since I've focused the vast majority of my brewing research and experience around all-grain, I'll simply offer that there is significant creative ROI, and some would argue quality ROI, from using the all-grain process, notwithstanding the additional time and equipment requirements. See Figure 1.

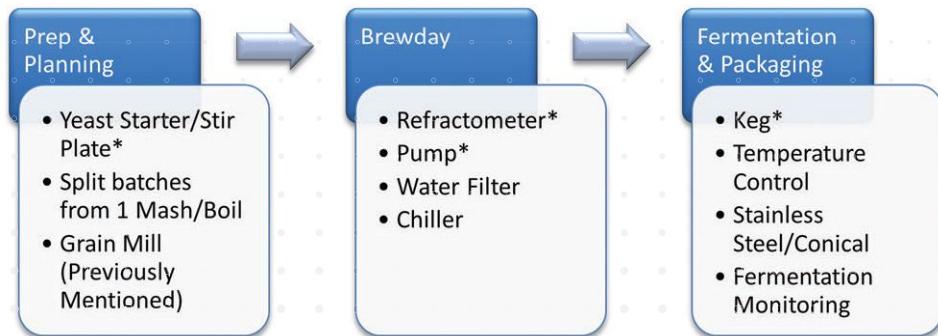
HEAVY HITTERS

Yeast Starters and Stir Plates

Beyond good cleaning and sanitization techniques, pitching a large number of healthy yeast cells is one of the most critical elements to producing good beer. With a minimal investment in an Erlenmeyer flask, stir plate, and some dry malt extract (or canned starter wort, like Propper Starter, which saves more time!), you can provide the best possible version of your chosen yeast to pitch. This can decrease fermentation lag time and mitigate off flavors related to under-pitching, which improves quality.

An alternative is to double pitch yeast packs or use one of the newer brands that

Figure 1



offer higher cell counts. Dry yeast is also a good option that's affordable and easily stored, and with the increasing availability of different varieties, it's advisable to always keep some dry yeast on hand in a pinch.

Kegs

A kegging setup is a big investment that may require hundreds of dollars for kegs and associated draft equipment, including CO₂ hardware, hoses, one or more draught faucets, and a kegerator or keezer. Smaller configurations that use 1- to 2.5-gallon kegs can work well for less money and overhead with similar benefits by using a picnic tap in an existing fridge. The ROI on kegging is significant for the seasoned homebrewer because it allows the brewer to

- Almost indefinitely reuse kegs.
- Save significant time in cleaning and racking to kegs versus bottling.
- Achieve fast, controllable, precise carbonation, especially for high-ABV beer that may struggle to bottle condition.
- Perform interesting experiments in the keg, such as dry hopping, adding fruit extracts, etc.

Pumps

A pump is another significant investment, but it can provide an all-grain brewery a lot of versatility. It may improve safety by reducing the need to transfer hot liquids by hand (and sometimes overhead), and it'll save your back! A good pump is a workhorse for brew processes as well—the same pump can recirculate the mash, con-

trol mash temperature in a RIMS/HERMS system, or pump wort through a plate or counterflow chiller, saving time and water, to name just a few.

For added convenience and safety, affordable wireless switches and plugs can be used to control the pump hands-free. Some are even compatible with smart home solutions such as Amazon Alexa.

Refractometer

This simple, inexpensive tool offers real-time gravity readings with just drops of wort during the boil. This provides great performance ROI to save time, be more precise, and make course corrections during the brew day. A quick refractometer reading lets you know if you need to adjust specific gravity by adding water or dried malt extract to hit precise recipe targets.

Refractometer specific gravity readings diverge from the true specific gravity as fermentation proceeds, which means you have to know the original gravity to back calculate the actual gravity. The TILT tool, discussed later, provides easy access to specific gravity readings throughout fermentation.

MIDDLEWEIGHT ROI

Time Savers

Split-batch recipe design almost made the heavy hitter list, especially because my wife and I have two young boys and time is at a premium. The concept is simple: design your recipe around one mash and divide the runoff into two different boils with associ-

ated hopping schedules and fermentation profiles. Or conduct one boil and split the hopped wort between two different yeasts and/or fermentation schedules. This lets you create multiple distinct beers for the roughly same amount of time and money.

For example, the Charismatic MangoFauna Cream Ale was actually split between 8 gallons fermented with WLP080 Cream Ale Yeast Blend, and 4 gallons fermented with Wyeast 3522 Belgian Ardennes yeast. Half of the batch that was fermented with cream ale yeast was kegged with 6 ounces of Amoretti Mango Artisan Natural Flavoring. In the end, three distinct beers—mango cream ale, cream ale, and Belgian table beer—were brewed for less than \$60.

As another example, 5 gallons of the Oceania and Homegrown IPA was diverted to another kettle before cooling, to which I added 3.5 ounces of my dad's homegrown hops. This great experiment changed just one variable and yielded two delicious but distinct beers.

Standard immersion wort chillers can be effective but often take more than 30 minutes to cool wort, prolonging the brew day and using significant amounts of water. Other heat exchanges, like plate chillers, can more efficiently cool the wort and pump directly into the fermenter, saving time and water.

Quality Savers

It's no secret that different yeasts react differently to temperature and pressure, with significant effects on beer characteristics and quality. In recent years, we've seen a wide range of do-it-yourself and commercial products that help control fermentation temperature control. Many, like glycol chillers (\$700 or more), are cost- and space-prohibitive, while others, like the BrewJacket Immersion Pro, are still relatively expensive (a few hundred dollars) but require less space.

There's no silver bullet here, but yeast choice can provide some good ROI for those not looking to dedicate the space, time, and money associated with classic cold fermentation to produce lagers and lager-like beers. Traditionally, Kolsch Ale Yeast and San Francisco Lager Yeast provided lager-like character at temperatures of 55°F (13°C) to 65°F (18°C), while limiting the need for extended lager condition time.

More recently, Norwegian kveik yeasts have proven themselves capable of producing clean, lager-like beers extremely quickly, a matter of days, at normal or elevated ale temperatures. So, if you are interested in producing lager-like character and want to maximize time and cost ROI, alternative yeasts will likely yield great results.

New fermentation monitoring tools like the Bluetooth TILT (\$135) can provide

real-time statistics for specific gravity and temperature throughout fermentation. This could reduce the need to take samples to determine when fermentation is complete (or ready for dry hopping), reducing risk of infection. It also provides a great record of actual temperature (much wider than I originally thought) throughout the fermentation for future analysis and feedback.

Try not to confuse precision for quality—these readings provide the best value in their ability to identify fermentation trends to compare to your tasting notes for each batch.

Many locations have adequate water chemistry without filtration or additives, but a simple carbon filter (\$50) is effective at removing chlorine and other unwanted flavors.

Long-Term Cost Savers

The upfront cost of a stainless-steel fermenter or conical may be five times or more than glass and plastic alternatives, but they provide superior durability and safety! I hope you have not experienced the shock and potential injury of dropping a full 6-gallon glass carboy after a five-hour brew day. Unfortunately, I have—lesson learned. Stainless fermenters also offer superior cleaning characteristics and usually more options for racking and/or harvesting yeast.



Oceania & Homegrown IPA

American IPA

This recipe yields two beers: 11 gal. (60.6 L) of Oceania IPA and 5 gal. (18.9 L) of Homegrown IPA. The two are mashed from a single grist and boiled as a single wort. After the boil, divide the wort into the two volumes, add whirlpool hops as indicated, and ferment as two separate beers.

Batch volumes: Oceania: 11 US gal. (60.6 L)
Homegrown: 5 US gal. (18.9 L)

Original gravity: 1.058 (14.4°P)

Final gravity: 1.012 (3.1°P)

Efficiency: 80%

Color: 7 SRM

Bitterness: 52 IBU

Alcohol: 6.2% by volume

MALTS & ADJUNCTS

26 lb. [11.79 kg] 2-row pale malt
3 lb. [1.36 kg] wheat malt
1 lb. [454 g] Dingemans Biscuit malt
12 oz. [340 g] honey malt
8 oz. [227 g] 40L crystal malt
8 oz. [227 g] 65L crystal malt
2 lb. [907 g] clover honey

HOPS

1 oz. [28 g] AU Galaxy, 13.3% a.a. @ 90 min
1.5 oz. [43 g] AU Galaxy, 13.3% a.a. @ 20 min
2 oz. [57 g] AU Galaxy, 13.3% a.a.,
whirlpool 5 min in Oceania IPA
2 oz. [57 g] AU Vic Secret, 19.6% a.a.,
whirlpool 5 min in Oceania IPA
2 oz. [57 g] AU Enigma, 17.5% a.a.,
whirlpool 5 min in Oceania IPA
2 oz. [57 g] AU Ella, 18.1% a.a.,
whirlpool 5 min in Oceania IPA
3.5 oz. [113 g] homegrown hops,
whirlpool 5 min after boil but before
cooling in Homegrown IPA
2 oz. [57 g] AU Galaxy, 13.3% a.a.,
dry hop 10 days in Oceania IPA
1 oz. [28 g] AU Enigma, 17.5% a.a.,
dry hop 10 days in Oceania IPA
1.5 oz. [113 g] homegrown hops,
dry hop 10 days in Homegrown IPA

WATER

Filtered water with 2 tsp. CaSO₄ and 2 tsp CaCL₂

YEAST

White Labs WLP051 California V Ale Yeast (2L
starter)

ADDITIONAL ITEMS

yeast nutrient
Irish moss

BREWING NOTES

Heat 11.2 gal. (45.4 L) strike water to 166°F (74°C) and mash in grains for a mash thickness of 1.33 qt/lb (2.8 L/kg), targeting a mash pH of 5.3. Mash for 60 minutes at 153°F (67°C) and then 15 minutes at 165°F (74°C).

Boil 90 minutes, adding kettle hops as indicated. After boil, divide into 11-gal. and 5-gal. worts and add whirlpool hops as indicated. Chill and rack to two fermenters. Ferment at 68°F (20°C) until specific gravity stabilizes at or near indicated final gravity.

Add dry hops to the two fermenters 10 days before bottling or kegging as indicated.

Creativity and Collaboration

"Beauty is in the eye of the beer holder."

—American singer/songwriter

Kinky Friedman

Saving the best for last, the most valuable facets of homebrewing, in my humble opinion, are creative and social. Only viewing homebrewing ROI through the lens of practical, nuts-and-bolts, linear inputs and outcomes would shortchange the hobby. As a handmade, artisanal, authentic craft, homebrew is more valuable than the sum of its parts. This is especially true when it's designed, brewed, or even just enjoyed amongst family, friends, and community. So, let's consider some ways to improve creative and social ROI.

One unique homebrewing advantage is the ability to make personalized, experimental, and commercially non-viable creations. These may never be profitable for a craft brewery, but they can be a perfect expression for your craft. It may seem counterintuitive to propose spending more money when talking about ROI, but there is real value in producing something truly unique. I'm sure there are more wild ideas out there, but a few examples of this are using native local ingredients (e.g., mangoes from your backyard or hyper-local wild yeast), experimental ingredients such as Thai basil, or expensive spices such as saffron.

Special-occasion brewing is another incredibly fulfilling way to share your passion, especially when collaborating to synthesize something exclusive and individualized to a wedding, birthday, promotion, or other milestone. My absolute favorite personal story about special occasion brewing happened by sheer coincidence,

and I still cherish the memories to this day (see *A Saison Love Story* sidebar).

Finally, embracing the brewing community and partners not only improves your access to economies of scale and equipment, but also quality through more objective feedback. It can also kickstart your creative and experimental juices to

try new things or techniques you wouldn't have tried alone.

Earlier this year, my brew partner Joe purchased a freshly dumped 33-gallon rye whiskey barrel that would have been well beyond my solo capacity. But together, we were able to pool resources and time to craft one of the best and most unique beers

Brew This!



Rye Edition: Any Porter in a Storm

Imperial rye porter aged in rye whiskey barrels

Recipe courtesy of J.B. Zorn.

BREWING NOTES

Heat 39.2 gal. (148.4 L) strike water to 169°F (76°C) and mash in grains for a mash thickness of 1.33 qt./lb. (2.8 L/kg). Mash for 50 minutes at 155°F (67°C) and then 20 minutes at 160°F (74°C).

Dissolve dried malt extract in the wort and boil 90 minutes, adding hops as indicated. Chill wort, transfer to fermenters (I used three due to capacity limits), and pitch yeast.

Ferment at 68°F (20°C) until specific gravity stabilizes at or near indicated final gravity. Transfer to a rye whiskey barrel and age until desired character is achieved, about 6–8 weeks.

ALTERNATE VERSIONS

Post-barrel additions: Remove quantity from barrel as desired to experiment. Condition on cocoa nibs and vanilla beans, i.e., 11 gal. (41.6 L) on 6 oz. (170 g) cocoa nibs with 4 split vanilla beans for one month. Rack to keg and serve as-is, or add final additions at packaging, such as cold-brew coffee (½ cup for 5 gal. or 125 mL for 20 L) or Amoretti Sour Red Cherry syrup (6 fl. oz. for 5 gal. or 190 mL for 20 L).

Parti-gyle: Use mash second runnings to brew 6 gal. of 1.040 (10°P) dark mild with 1 oz. (28 g) Cascade hops @ 75 minutes, fermented with White Labs WLP002 English Ale Yeast.

MALTS

75 lb. (34 kg) 2-row pale malt
8 lb. (3.63 kg) rye malt
8 lb. (3.63 kg) Special B malt
6 lb. (2.72 kg) chocolate malt
4 lb. (1.81 kg) chocolate rye malt
2 lb. (907 g) roasted barley
15 lb. (6.80 kg) dark dried malt extract (boil)

WATER

Filtered water plus 2 tsp. CaCl₂ per 10 gal.

HOPS

8 oz. (227 g) Columbus, 17.3% a.a. @ 75 min
4 oz. (113 g) East Kent Goldings, 5% a.a. @ 10 min

YEAST

White Labs WLP002 English Ale Yeast (2L starter per fermenter)

ADDITIONAL ITEMS

yeast nutrient
Irish moss

A SAISON LOVE STORY

I met my wife Rachel on New Year's Eve 2008, a day on which I also happened to brew my 14th batch of homebrew. Little did I know that this batch of saison would engender a special connection in our beer journey together, let alone become what has grown into our all-time favorite style.

To top it off, I proposed on a bottle of my 32nd batch of homebrew—also a saison—and in 2020, we celebrated our 10-year wedding anniversary with another special saison that clocked in at just over 9 percent ABV.

I've ever been a part of: Any Porter in a Storm, an imperial rye porter aged in rye whiskey barrels.

In brewing that beer, we employed techniques to maximize our ROI from the more than 100 pounds of grain that went into the mash tun. We ran it as a parti-gyle mash and captured the second runnings to create a delicious 4% ABV dark mild ale we served on nitro. Furthermore, we split 15 gallons onto cocoa nibs and vanilla beans, followed by separate keg additions of cold-brew coffee, red sour cherry flavoring, and star anise and Ceylon cinnamon.

CLOSING THOUGHTS

Just as every homebrewer and homebrewery are unique, so, too, are the passions that drive their version of value. I'm encouraged by the expanding access to unique and relatively affordable homebrew equipment that promises to provide more ROI in the future. I'm also excited about the growing communities of our fellow homebrewers who provide excellent analysis, experimentation, and commentary that elevate our craft and access to information online and beyond.

To maximize ROI, you can take classic, cost-minded approaches to get the best

bang for your buck while also methodically saving time and improving consistent quality through smart applications of equipment and process. Never forget to embrace the social, creative, and artistic sides behind the craft. And, above all, enjoy the journey.

J.B. Zorn is a Certified Cicerone, BJCP judge, award-winning homebrewer and all-around beer nut. When he's not enjoying beer or music with family and friends, he proudly serves in the U.S. Coast Guard.

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The Lost Healthy Beers of Belgium





By Roel Mulder

In June 1582 Maijcken Jacquets, a woman who probably lived in or near Brussels, wrote down a collection of fascinating medicinal recipes. "Against jaundice: take goose droppings, mix them with beer, sieve and then drink it lukewarm at noon and at night."

To prevent children from wetting their beds, Maijcken recommended either feeding them skinned and fried mouse, or Hamburg or English beer enriched with various herbs. Too much "air in the heart" could be cured by chamomile boiled in good beer, and henceforth breaking wind would not be a problem anymore.

Maijcken Jacquets's remarkable recipes are only one example of the many times beer was used with the goal of improving the drinker's health. Of course, we always drink to each other's health, but some beers were considered healthier than others. The 19th-century Zoeg beer from the town of Tienen for instance, was known as "doctor's beer" because three of the five owners were

doctors of medicine. Zoeg means "sow," by the way, but the reason for this name is lost in the mist of time.

In the 19th and early 20th centuries, beer was considered the healthier alternative to gin. When in 1907 the socialist party in the city of Ghent built its own brewery, one reason was that "the production of good healthy beer could be a contribution to the battle against alcoholism."

As we all know, drinking too much beer at once is not particularly healthy, but moderate consumption can have favorable

effects on the heart, veins, type 2 diabetes, and dementia. Even yeast can be beneficial: after all, it's full of vitamin B. Until about 1975 the De Koninck brewery in Antwerp used to sell its yeast to locals who showed up with a jug or a glass to get a fill.

It isn't my intent to describe beers that to the modern reader might have an actual claim to being healthy. However, it is interesting to see how people regarded this subject in the past. So, naturally, enjoy the history, but don't mistake anything here for actual medical advice! →

Brew
This!



Uitzet, 1851

You probably won't have access to the original Wetteren water, which was supposed to be the best in Belgium, according to Dr. Wauters. Otherwise, this is a pretty straightforward recipe for a rather bitter beer.

Batch volume: 20 L (5.28 US gal.)

Original gravity: 1.047 (11.7°P)

Final gravity: 1.017 (4.3°P)

Efficiency: 75%

Color: 15 SRM

Bitterness: 40 IBU

Alcohol: 4% by volume

MALTS & ADJUNCTS

2 kg [4.4 lb.] Pilsner malt

1.9 kg [4.2 lb.] Munich malt, 6°L

150 g [5.3 oz.] Weyermann Carafla I malt

HOPS

90 g [3.2 oz.] Hallertau (or similar)

YEAST

Top-fermenting, low attenuation

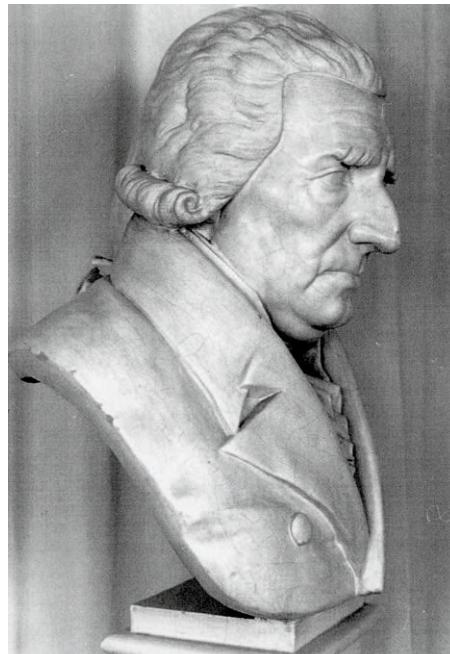
BREWING NOTES

Originally, brewers preferred to use six-row barley for this recipe, malted to a light amber color. To approach this and to simulate the 10- to 12-hour boil, Munich malt and color malt have been used here. After crushing, leave the grain for a day or so.

In your mash-lauter tun, add chaff or rice hulls and then add the malts. Add hot water and stir. Run off the first wort after 15 minutes. Add this "slime" to boiling water, and add this to the mash again.

As this is a rather bitter beer, you can use one-year-old hops to obtain a smoother taste.

To make a double uitzet, aim for 5.6% ABV. Double uitzet can be kept for a few months or a year, and can be blended with fresh ordinary uitzet.



Pierre-Englebert Wauters and his book called *Dissertation on the manner to make Uytzet and on its healthiness*.

UITZET

In 1798, a remarkable book was published in Ghent by Pierre-Englebert Wauters, doctor of medicine at the civil hospital of that city. Ghent is not as well known to tourists as nearby Bruges, but it has a huge medieval city center whose beauty easily rivals that of its more famous neighbor. Ghent is also more vibrant, not in the least because of its large student population.

Anyway, Dr. Wauters had already written a few noteworthy works, including an analysis of ways to prevent people from being buried alive and a discussion of indigenous Belgian plants that could be used as a substitute for olives for making oil. But his newest opus was called *Dissertation on the manner to make Uytzet and on its healthiness*. *Uytzet* or, in current spelling, *uitzet* was—you guessed it—a type of beer.

According to Wauters, *uitzet* was invented by a certain Van Petegem, innkeeper in the village of Wetteren, about 20 kilometers downstream from Ghent on the river Scheldt. One day, he had apparently almost run out of beer. A new batch of brown beer would not have been ready in time, if only because it would have needed to boil for no less than 30 or 40 hours. Instead, Van Petegem took a few barrels of beer that had boiled for "only" five to six hours and added some old yeast. The brew fermented forcefully and was clear and ready to serve in only three days.

This new beer was such a success that within a few years, all innkeepers in Wetteren only brewed *uitzet*, while brown

DISSERTATION

SUR LA MANIÈRE DE FAIRE

L'UYTZET,

E T

SUR SA SALUBRITÉ,

COMPARÉE

Avec celle des autres Bières & autres Boissons,
qui sont le plus en usage dans les neuf
Départements réunis,

PAR P. E. WAUTERS,

Membre de la Commission de Santé de GAND, des Sociétés de Médecine, &c. de BRUXELLES, d'ANVERS & ci-devant de celle de PARIS; Médecin des Hôpitaux civils de la Ville & Canton de GAND, &c.

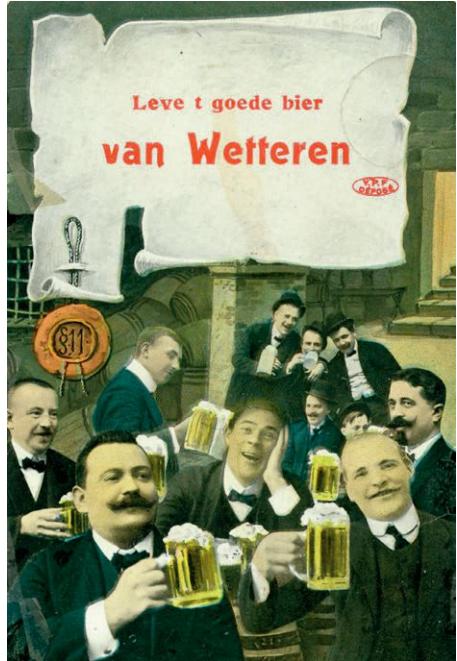
A GAND,
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THERMIDOR, AN VI.

beer all but disappeared. All over eastern Flanders, brewers started making it as well, especially in Ghent itself. The name of this new beer type became *uitzet*, allegedly because it had originally been set apart (*uit* means "out" and *zet* means "to set"), but there are other explanations. It could also simply mean "export" or refer to its alleged diuretic qualities.

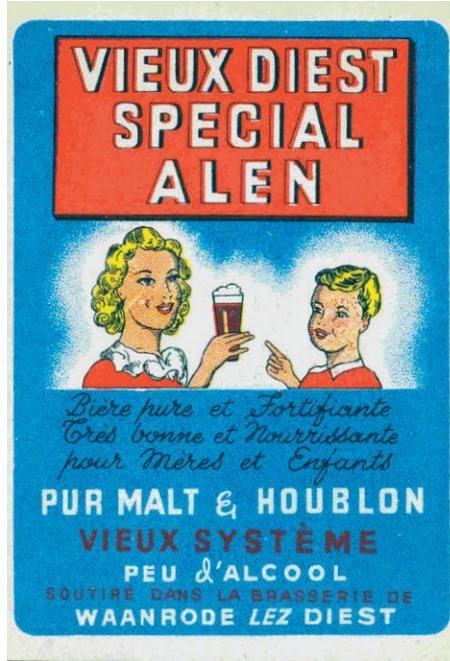
Whatever its origins, according to Dr. Wauters, *uitzet* was particularly healthy. Because of its relatively simple recipe, brewers had to use the finest ingredients: only barley, mostly of the six-row variant, and hops from Aalst. The finest water was of course to be found in Wetteren itself.

And why was *uitzet* so healthy? As an example, Dr. Wauters cites the dysentery outbreak of 1791. In the city of Dendermonde, where people drank a lot of white beer, there were many victims, while in *uitzet*-drinking Wetteren, many fewer died. In 1794, there was a similar difference between the number of victims in Wetteren and those in Aalst. Within all of these towns, *uitzet* drinkers were less affected than consumers of other beverages. Also, the relatively small village of Wetteren recently had seen two people reach the blessed age of 100 years.

From this rather anecdotal evidence, Dr. Wauters concluded that *uitzet* was by far the healthiest drink in the country—healthier than coffee, tea, wine, and even plain water, even if it was perfectly clean. This, of course, prompts the question of



Advertisement for uitzet beer.



Advertisement for Diest beer.

“
Dr. Wauters concluded that uitzet was healthier than coffee, tea, wine, and even plain water.

how uitzet was made. In his 1798 book, Dr. Wauters supplies a recipe, as does French engineer Georges Lacambre in his 1851 brewing manual.

As noted, the main ingredient was six-row barley, malted to a light amber color. It often would be left to rest a little to absorb some humidity. Mashing took place in a wooden mash tun with, at least in the older recipes, a layer of straw or chaff on top of the false bottom. Malt was poured onto that layer, and then hot strike water was introduced from beneath the false bottom.

After only 15 minutes, the first mash would be collected. This first mash was called the “slime.” The authors don’t agree on what to do with this slime: according to Dr. Wauters, it was kept apart and boiled to produce small beer. In this way, the slimiest parts of the malt were taken out. Lacambre opposed this practice: he thought it was best to add the slime to the kettle with the boiling water for the next mashes. In the end, the main mashes were

brought together and boiled for no less than eight to ten hours.

There actually were two versions of uitzet. There was a simple version at 4% ABV, which was enjoyed after about two to three weeks. For simple uitzet, sometimes hops from the previous year were used so that it wouldn’t be too bitter and could be consumed quickly. The double uitzet was about 4.9% ABV, was mostly brewed in winter, and was yellow to amber in color. It often was kept until summer and then blended with young beer, although sometimes it was kept for two years. Dr. Wauters mentions drinking a five-year-old uitzet that tasted “just as nice and strong as a one year old beer”.

Uitzet remained a popular beer in eastern Flanders throughout the 19th century. It was also made by breweries in Bruges and even across the border in Holland. Originally, it had been a relatively modern beer, as it was made with only barley malt. Also, Dr. Wauters recommended that brewers use a

Double
Diest, 1851

Brew This!

Georges Lacambre describes this beer in his brewing manual, and what a beer it is: heavy, poorly attenuated, creamy, and honey-like. At the time, it was considered perfect for breastfeeding women, but although beer does contain substances that stimulate lactation (prolactin), the alcohol in beer has the opposite effect.

Batch volume:	20 L [5.28 US gal.]
Original gravity:	1.082 [19.8°P]
Final gravity:	1.036 [9°P]
Efficiency:	75%
Color:	19 SRM
Bitterness:	23 IBU
Alcohol:	6% by volume

MALTS & ADJUNCTS
 2.9 kg [6.4 kg] raw wheat
 2.83 kg [6.2 lb.] Pilsner malt
 1.12 kg [2.5 lb.] raw oats
 250 g [8.8 oz.] Weyermann Carafa I malt

HOPS
 68 g [2.4 oz.] Hallertau (or similar)

YEAST
 Top-fermenting, low attenuation

BREWING NOTES
 To simulate the original boiling time (8 to 10, or even 20, hours) and its effects on the beer’s color, some color malt has been added to this recipe. Early 20th-century recipes involve the addition of invert sugar or molasses. Add some if you want a really sweet beer. Try cinnamon for taste, as at least one old newspaper advertisement mentions this as an ingredient.



Brewery Cerckel, the city of Diest's last, which closed its doors in 1980.



Advertisement proclaiming Diest's energy-giving properties.

Brown Diest, 1879

A rare spontaneously fermented beer outside Brussels. Unfortunately, not a lot is known about this obscure beer style, but it's a fun recipe to try.

Batch volume:	20 L [5.28 US gal.]
Original gravity:	1.043 [10.7°P]
Final gravity:	1.015 [3.8°P]
Efficiency:	75%
Color:	23 SRM
Bitterness:	50 IBU
Alcohol:	3.7 % by volume

MALTS & ADJUNCTS

3 kg	[6.6 lb.] Pilsner malt
400 g	[14.1 oz.] raw wheat
350 g	[12.4 oz.] Weyermann Carafo I malt

HOPS

110 g	[3.9 oz.] Hallertau (or similar)
-------	----------------------------------

YEAST

Spontaneous fermentation!

BREWING NOTES

Originally, the color was reached through a long boil of 12 hours. Here, color malt has been added to simulate this. Age this beer in barrels, and then blend with fresh brown beer.

thermometer, which was quite a novelty in a conservative brewing country like Belgium.

The First World War spelled the end for uitzet. The German army requisitioned many brewing kettles and other equipment for copper, and after the war, many breweries either closed for good or were rebuilt, during which time they modernized their range of beers. Only a few breweries kept making uitzet. It was last seen in the 1950s as a table beer of perhaps 1.5% ABV.

The question remains: was uitzet really as healthy as Dr. Wauters claimed it to be? It is hard to say. All we know is that it did not do the doctor himself any harm: he lived to be almost 95 years old and died in 1840.

DIEST

More than 100 kilometers to the east of Ghent lies Diest, a nice old town that today has a population of about 25,000. It has quite a few old buildings of interest and a lovely park that once was a private garden belonging to the Cerckel brewery, the city's last, which closed its doors in 1980. In fact, the Cerckel brewery was founded on the grounds of a former abbey that was established there in the 13th century.

Diest was once home to a beer of the same name, which during the 19th century especially, was advertised as "tastier and more forceful than wine, recommended by doctors of medicine as very healthy and strengthening." It was also seen as particularly useful to nursing women, as Diest beer was said to stimulate lactation. In 1892, a café in The Hague in the Netherlands advised it "Against influenza! It contains the healthiest herbs, among which the most recommended by doctors, cinnamon." But as we shall see, herbs or spices were not a usual ingredient of Diest beer, as far as we

know. Or were spices a secret ingredient not related to us by written sources?

Diest had been exporting beer to other towns since at least the 16th century, and by the 18th century its beer was also popular across the Dutch border in Tilburg. Diest beer was known as being particularly sweet, and in 1658 it was described as "well-feeding." In 1829, Dr. Jean-Baptiste Vrancken was the first to describe it in detail. Vrancken was also a doctor of medicine, but oddly, he did not mention its supposed medicinal qualities.

In any case, Vrancken tells us that its color was somewhere in between brown and pale and that it was made of barley malt and unmalted wheat and oats. The grains were milled without adding too much water, and to keep them from forming a thick mass, brewery workers had to work them with their feet! The yeast yielded by the beer was also very popular as an export product. A daily shipment of yeast was sent to customers, mostly bakers and distillers, as far away as Antwerp and Brussels, a distance of some 60 kilometers.

In 1851, brewing engineer Lacambre mentioned two types of Diest beer: the ordinary version known as "civilian's beer" and the double Diest or "pub beer."

The double Diest could have an original gravity as high as 1.082, but it was often no more than 55 percent attenuated, which would lead to a relatively sweet beer of about 6% ABV, which is still quite high for Belgium in those days. Lacambre described it as having a pleasant, mellow taste, creamy, and almost honey-like. In winter, it would last as long as three months, though other sources mention that it could be kept in bottles for two or three years.

Lacambre is also the first to mention the *Gildenbier* or “guild beer” of Diest. Either similar to double Diest or even twice as heavy, it was a beer brewed especially for the civic guard guilds. These guilds once were medieval voluntary organizations of citizens that functioned as a kind of city police. By the 19th century, these guilds had lost their original function, but in Diest they remained active as social associations. At their annual gathering, the *Gildenbier* was their drink of choice. Apparently it was also auctioned at fundraising events. At least two of these guilds, the Saint Sebastian’s guild and the Saint George’s guild, still exist today. *Gildenbier* is now produced by the Haacht brewery, some 35 kilometers away, as a 7% ABV brown barley beer.

Back to the common Diest beers—a 1879 brewing manual by Cartuyvels and Stammers describes a third Diest beer, simply called “brown” with an original gravity of only 1.043. Its keeping variant was fermented spontaneously and was blended with young beer, not unlike lambic or Flemish oud bruin.

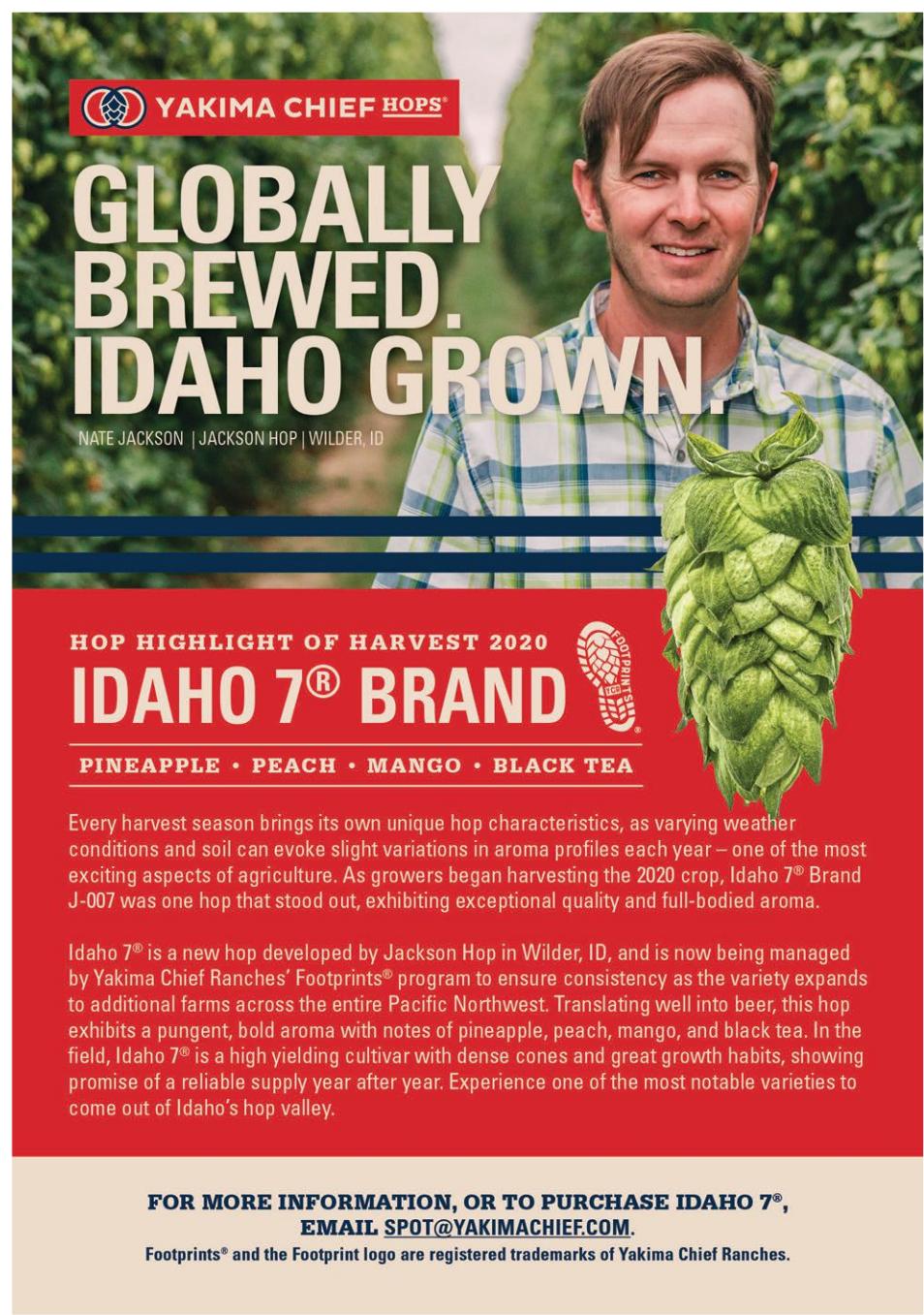
In the 20th century, the history of Diest beer becomes sketchier. The *Gildenbier* remained on sale in all its glory, while its lighter, healthier counterpart grew darker and sweeter. In 1905, it was said to be made with colored malts or colorants to obtain a dark red color. In the kettle, the brewers would add sugar, invert sugar, or molasses, and shortly before delivery, some more invert sugar would be added again. Truly a beer full of energy perhaps, but one wonders if it was all that tasty.

After the Second World War, attempting to remain relevant as a “healthy” product, Diest beer developed into a family-friendly, low-alcohol drink. Labels and posters showed happy families with mom and dad watching their little baby enjoying a sip of brown-colored Diest beer, or their ten-year old son showing his strong biceps, which naturally he got from frequent consumption of said drink.

In 1966, the beer was even protected by royal decree. Thenceforth, only beer with an original gravity of 1.050 but less than 1.25% ABV could call itself Diest beer. It could only be colored using malt or caramelized sugar, and only sucrose could be used to sweeten it. None of this helped: though beer in Belgium is a part of everyday life, even family life, feeding it to children became less and less popular. In 1980, the last brewery of Diest

closed its doors, and the Royal Decree was abolished in 1993. Production of a “Very Diest” table beer continued at Haacht brewery until 2005 or so. Now, even that is history.

Roel Mulder is a Dutch historian writing about beer history. He has written a book about Dutch beer including historical recipes and is currently researching the origins of the many Belgian beer styles. 



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An aerial photograph of a river flowing through a lush, green tropical forest. The river curves elegantly through the landscape, with its banks covered in dense vegetation. The water is a dark, reflective blue-grey. In the upper right corner, there is a stylized, hand-drawn black outline of a wavy line that loops around the text.

**WOULD YOU
DRINK MY
SPIT?**



Exploring the Amazonian Tradition of Manioc Beer

By David Schmidt

My friend Rex and I sat in his backyard one night, prepping the mash for a new brew. A balmy San Diego breeze rustled the trees, lending a warm, almost tropical air to the evening. Although we had brewed countless times before, tonight's recipe was a first for both of us.

"You ready, David?" Rex asked me with some trepidation.

"As ready as I'll ever be," I replied.

"All right, then." He handed me a piece of boiled manioc root. We both took a bite and chewed slowly.

Then we leaned over and spat the root out into the brew pot.

As you may have guessed, Rex and I first decided to brew up a batch of "spit beer" during the pre-COVID-19 days. It was a simpler time, back when the thought of drinking another person's fermented saliva was only mildly nauseating, not a cause for hospitalization.

And yet, believe it or not, the process of brewing manioc root *chicha* is remarkably sterile, eliminating both human pathogens and the natural toxins in the root itself. This is an ancient tradition, fine-tuned over millennia by the native peoples of the Amazon and Caribbean.



Friends of the author holding a boa constrictor snake during a 2000 volunteer church trip to Pucallpa, a rural community of inland Peru.

WELCOME TO THE JUNGLE

The Amazon basin is a vast, colossal region, covering seven million square kilometers (2.7 million square miles) and spanning nine nations. At least 30 million people live there, representing 350 different ethnicities. For centuries, the rugged terrain seemed impenetrable to all but the most adventurous outsiders, and myths and rumors spread about the people and creatures who inhabited the forest. Even today, the Amazon is home to some of the last “uncontacted tribes” on the planet, such as the Awá of Brazil. Some of the most ancient human traditions are preserved there, ancestral enigmas shrouded in thick jungle.

I traveled there in 2000 on a volunteer church trip to dig a well in a rural community of inland Peru. We took a small puddle-jumper from Lima to Pucallpa, an outpost city in the heart of the jungle. The city is a small dot of asphalt invading the ancient wilderness. The forest leans in on all sides, always poised to swallow the city up and take back what it calls its own.

The steamy street markets of Pucallpa sell such jungle delicacies as boa constrictor meat and massive grub worms. When I asked for a dozen worms, the vendor sold them to me live, squirming inside a bag of sawdust. Tourists can buy blow darts, freeze-dried piranhas, and shoddily taxidermied monkeys. Tribal people often come down out of the jungle to shop for wares in Pucallpa. It is not uncommon to see native men walking barefoot down the paved streets, wearing only a small loincloth.

That pavement doesn't last very long. After a few kilometers of city, motorcycle taxis stand waiting to take passengers down

“
*Not bad
for
fermented
spit,
I thought.*

the dusty dirt roads of the *pueblos jóvenes*, newer settlements on the outskirts of town. These communities constitute the borderland between city and jungle.

A few days into our visit, our group took a boat excursion down the Ucayali River. This headstream of the Amazon is 1,600 kilometers (1,000 miles) long and home to many unique species. A wooden canoe outfitted with an outboard motor took us upstream, past the same villages that would later appear in the film *Motorcycle Diaries*, regarding the youth of Ernesto “Che” Guevara.

As our canoe shot along the placid brown surface of the Ucayali, our guide explained that the river was over a kilometer (3,300 feet) wide at some points.

It reached a depth of several meters, making it a rich habitat for unique species. He assured us that craggy river turtles and swarms of piranha swam just beneath the surface. Several times, we spotted the pinkish crests of Amazon river dolphins, one of the world's only species of freshwater dolphin.

As our guide pointed out a pod of them, I noticed something else on the opposite side of the boat. A massive, squarish head broke the surface, shiny and dark-colored. The captain and other passengers spotted it, too.

“What was that?” I asked. We all stared as the creature dived back into the depths.

“That...” the guide stammered. “I've never seen one of those before.”

The jungles along the Ucayali are one of the many regions where people cultivate manioc plants and brew the roots into chicha. The Shipibo natives who live just upriver from Pucallpa, for instance, have long practiced the tradition of chewing manioc and fermenting it into a drink they know as *masato*. And yet, my first taste of chicha was not in the jungle at all—it was back at the Lima international airport.

I had read about chicha in anthropological accounts of the distant jungles and highlands. I was surprised, then, to see it advertised at an airport kiosk as soon as I arrived in Peru. I walked up to the kiosk and paid a few sol coins for a glass of chicha. It was bright purple, with a sweet, pleasant aroma. I was surprised to find it extremely palatable—refreshing in the summer heat, with mild flavors of tangy lime and cane sugar. *Not bad for fermented spit, I thought.*

Turns out, it was neither fermented nor spit. This version of “chicha” was a modern adaptation of an ancient brew, a non-alcoholic refreshment made with purple corn, lime juice, and sugar. A similar adaptation exists in northern Mexico, where *tesgüino*, the traditional corn beer of the Rarámuri natives, has been modified into a more palatable non-alcoholic blend involving cane sugar, lime, salt, and even ice cream.

“Chicha” is actually a catch-all term in much of South America that’s used for a variety of alcoholic and non-alcoholic drinks made from corn and manioc roots. Such beverages are ubiquitous in the Amazon region, where manioc is a cultural cornerstone, as central to human life as bread and wine are in the Old World.

GIVE US THIS DAY OUR DAILY MANIOC

The custom of turning manioc roots into bread and drink is as widespread as the cultures that practice it. Indigenous people brew chicha throughout Brazil, Colombia, Venezuela, Ecuador, Bolivia, Peru, and the Guianas (French Guiana, Guyana, and Suriname). A diverse array of cultures make it, from the reclusive Kuikuro of Brazil to the bellicose Jívaro of Ecuador and Peru, famed for collecting the shrunken heads of their enemies. Even communities of African descent throughout the West Indies make chicha, having learned the technique from the Arawak natives.

Chewing and spitting.



Boiled manioc.

Fermented manioc is known by a wide variety of names in the different languages of the Amazon: *parakari* and *kasiri* among the natives of Suriname and Guyana, *nihamanchi* among the Jívaro, *kurai* among the Wai Wai of Brazil, and many others. For clarity’s sake, I will refer to all of them by the general term “chicha.”

The main ingredient of the beverage is manioc (*Manihot esculenta*). It is a shrub plant cultivated primarily for its starchy root, a whitish tuber similar to the potato

and equally rich in carbohydrates. While the root is often referred to as “cassava,” I have opted for the term “manioc” here, as “cassava” also refers to bread made from manioc flour. The tuber’s most common name in Spanish is *yuca*, and fried strips of *yuca* are eaten as a delicious snack in many Central and South American cities. Following the Spanish colonization of this continent, the hearty plant spread to Asia and Africa as well, where it is still widely consumed today.





Chicha in fermenter.

In the Amazon, manioc is a cultural staple and a major source of nutrition. It has been cultivated by people for millennia, with evidence of manioc fields dating to 2000 BCE in the Orinoco region. The manioc garden is traditionally planted by men but tended by women, for whom it is often a place of refuge. Young girls rest there during their first menstruation, and many babies are both conceived and born in the manioc garden.

The harvested roots are washed and peeled in the river, often in the same spot where women bathe themselves and their children. The root must be thoroughly peeled, washed, and cooked, as it contains poisonous hydrocyanic acid. A variety of methods are used to grate or mash it into a fine pulp, which is then dried into flour and baked into cassava bread. Some of the most ancient cultural artifacts found in the region are ornately decorated manioc graters, carved by natives from wood and embedded with sharp fish teeth.

The communities who farm manioc take advantage of every part of the plant. Some cultures boil the leaves and eat them as a rich source of protein. The liquid extracted from soaking raw roots can be boiled to eliminate its toxins; this broth is then cooked with peppers, fish, and meat and served to guests as a hearty stew. The Barasana people of Colombia and Brazil cook older, inedible leaves and use them to darken the lacquer on ceramic pottery. The

Barasana also save the pure tapioca starch of the root and bake a special cassava bread from it; this is given to girls during their first menstruation, and to boys during holy initiation rites. In the Caribbean, the pure tapioca starch of the plant is also used as laundry detergent.

The plant's toxic juice appears in the darkest chapter of the continent's history. During the Spanish colonial period, when landowners forced natives to labor on their Caribbean plantations, desperate workers found tragic relief in the manioc root. They would band together in suicide pacts, drink the raw juice, and escape the horrors of the plantation forever.

However, the hydrocyanic acid has many practical applications as well. Natives often soak the raw roots in water and save the toxic liquid. The Wapishana and Macusi people use it to poison fish and catch them, while the Wai Wai of Brazil use it as an effective flea-killing shampoo for their dogs. (Taking care to hold the animal's head still, lest it try licking the fresh poison from its body!)

Of course, one of the most important uses of this plant consists in the ancient art of fermentation: turning manioc into chicha.

SACRED DRINK OF THE GODS

As is the case with so many ancient brews, going back to the first beers of Egypt and Mesopotamia, chicha is a liquid form of a major food staple.

I have come across this phenomenon time and time again. The corn that forms the tortillas eaten by the Rarámuri natives of northern Mexico is also fermented into *tesgüino* ("¡Viva la Fermentación: Ancient Homebrewing in Modern-Day Mexico," May/June 2011). The *teff* grain milled into Ethiopian flatbread becomes *t'alla* beer. ("Drinking in the Cradle of Humankind," Sept/Oct 2019). Traditional brews are not just intoxicating, but highly nutritious as well.

When Amazonian communities set out to make chicha, they go all in, brewing enough for a feast that can last several days. The term "feast" may be misleading to the Western reader, as no food is consumed at these gatherings. The process of drinking chicha is kept separate from cooking and eating. Not only does the drink provide ample nutrition on its own, but this practice highlights its unique and sacred nature as well.

A feast can be held to celebrate a milestone in a child's life, a sacred initiation, the clearing of a garden, or a person's recovery after illness. It may take place to prepare for battle, or simply as a general social gathering. The hosts prepare massive quantities of chicha, often 10 gallons (38 liters) or more. Women set aside all other tasks and spend several days focused exclusively on preparing chicha: boiling manioc, chewing the root, spitting it into the pot, and fermenting it.

Special containers are used for the beverage: ornately decorated clay vessels and massive troughs carved from tree trunks. People attend a feast in their finest adornments: feather headdresses, monkey fur, beaded arm and leg bands, and bodies painted with complex designs. Agreements are reached, treaties made, and spouses selected.

The feast also serves as recreation, an escape valve to release the tensions of daily life. Although the alcohol content of traditional chicha is usually between 2% and 4% by volume, revelers get thoroughly drunk from the large amounts they consume. It is extremely rude to pass on the offer of a drink, and the feast isn't over until the chicha has been finished. If needed, a person may discreetly lean to the side and vomit to make more room. Some men snort hot pepper juice to clear their head and keep drinking (sounds like a few New Year's Eve parties I've attended).

More significantly, it is similar to another ancient drinking tradition I have experienced firsthand: the *tesgüinadas* of the Rarámuri in Mexico. Like many other traditional brews around the world, chicha is so much more than just an alcoholic beverage. It developed in a closely knit network of other traditions—food, community, societal roles, and spirituality.

Excavations in Puerto Rico and other Caribbean islands have uncovered stone figurines known as *zemi*, which are believed to represent the Arawak god who first gave manioc to humans. This is common in many cultures—brewing is seen as a gift from the Heavens, a miracle. Many Amazonian tribes have their own legends about the mythical origins of the plant.

These, and other sacred stories, are often told during chicha feasts. Revelers dance and sing traditional songs. Some feasts involve music and instruments that are so sacred, only initiated men are allowed to participate.

Brew
This!



AMAZONIAN CHICHA

Traditional brews can be notoriously imprecise, and this is especially true with manioc chicha. I present readers with several possible ingredients and brewing options here, based on different chicha traditions across the Amazon. Initial gravity and alcohol content can vary substantially from one batch to another.



SAFETY DISCLAIMER

Uncooked manioc root contains hydrocyanic acid, which is toxic if ingested. Commercially available manioc roots are typically the smaller-rooted, sweeter varieties, which contain much lower levels of the toxin. Still, it is extremely important that you peel and thoroughly cook it. In high quantities, cyanide can cause goiters, intoxication, muscle paralysis, and possible death. Be sure to cook it well.

INGREDIENTS

5 lb. [2.27 kg] manioc

Your basic ingredient will be sweet manioc root (cassava). You should start with 5 pounds (2.27 kg) of manioc according to dry, pre-cooking weight. Many Asian, Latin American, and African markets and specialty shops sell whole manioc. Look for roots that are free of any blemishes or signs of decay.

ADDITIONAL OPTIONAL INGREDIENTS

These optional secondary ingredients are inspired by various chicha traditions from across the Amazon.

17–34 fl. oz. [0.5–1 L] sugarcane juice

I highly recommend using an additional source of sugar to aid in the fermentation process. The most authentic option would be to add freshly squeezed sugarcane juice, which is used in many tropical regions where the cane is available. You can add this to the boil, and/or soak the cooked manioc root in the cane juice before chewing it (see below). Alternately, you could buy a couple of pieces of whole sugarcane and add them to the boil for sugar and flavor.

1 lb. [454 g] malted barley

While malted barley is not native to the Amazon, it will help with the necessary conversion of the manioc starch. If you add a pound or less of malted barley to the boil (see below), its enzymes will help convert more of the starch to sugar, beyond what the enzymes in your mouth accomplished. Consider it a “saliva enhancer.”

1–2 lb. [454–907 g] sweet potatoes

Many cultures brew chicha with a mix of manioc and sweet potatoes. Not only will this add additional starch and complexity of flavor, it will also improve the flavor of your tuber mix. Many long hours of chewing await.

To taste additional tropical fruits

Some communities add various tropical fruits to their chicha for additional sugars and flavor. Plantains and bananas are common in the Amazon, although any number of tropical fruits—lychee, passion fruit, pineapple—would be a fine addition to chicha. The sky's the limit. For maximum flavor, add it to the secondary fermentation.

YEAST

Any ale yeast should work. I personally recommend *Saccharomyces cerevisiae* var. *boulardii*, as it is a tropical yeast that has developed in hot climates similar to the Amazon, and it is particularly suited for fermenting cane sugar and tropical fruit. Alternately, a nice Belgian yeast will do the trick. Because manioc and tropical fruit can take some time fermenting, you may want to jumpstart your yeast with a sugar solution a few days before brewing.

BREWING NOTES

Peel the manioc and boil it for 30 minutes. This is **extremely important**, as the root is toxic when raw. Most of the toxins are contained in the peel, so peeling is key. Although the boiling process should neutralize any hydrocyanic acid contained in the manioc, it's a good idea to discard the water from the boil as well to be safe. Or, save it and dump into the lake the next time you go fishing if you're not a patient fisherman.

If you are using sweet potatoes as well (1 to 2 lb.), peel and boil them separately, and then toss them in with the drained, cooked manioc. One option to make the tubers more palatable is to soak them in sugarcane juice first. This is not simply a “cop-out,” as it is a culturally authentic practice among many natives of the Guianas.

Now comes the fun part: hours and hours of chewing and spitting. As boring as it can be, it's important to take your time. Bite off a small piece of manioc and swish it around your mouth well, to make sure the starch comes into full contact with your natural enzymes. Once this disgusting mess has the approximate consistency of baby vomit, spit it out into your brew pot. Then repeat the process about a million times.

Sure, it's boring and tedious, but just think—this is what mother birds go through every day, and you don't hear them complaining. I recommend lining up some entertainment ahead of time. Prepare a good playlist of music and podcasts, and chill a few bottles of homebrew to drink while you're chewing.

Once you've chewed and spat your way through all the manioc, you are ready to brew.

The spit mixture in your pot should come to less than a gallon at this point. Add enough water to bring it up to about 2 gallons. From here, your brewing process will be similar to any other brew. If using sugar cane and/or malted barley, add it to the liquor at this point.

Bring the “manioc mash” up to 160°F (71°C) and hold it there for 30 minutes so that starches in both the manioc and barley malt will convert into fermentable sugars. Then boil it at 212°F (100°C) for another 20 minutes to sterilize everything. Considering how much of your own spit this brew contains, your guests will thank you.

You can expect an initial gravity of roughly 1.045 (11.2°P), with a final ABV of 5–6%. Again, however, these measurements can vary greatly. Note that you may need to use a funnel to transfer the wort into your fermenter. Due to the thickness of the manioc, it may clog your siphon.

Optional: If using additional tropical fruit, add it for a secondary fermentation afterwards. The alcohol should kill any contaminants, but as with any fruit beer, you may want to sterilize the fruit with sulfur dioxide to be on the safe side.

Also optional: while traditional chicha is not carbonated, carbonating it when bottling can make it much more palatable.

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The women who prepare chicha observe special fasts and taboos while doing so. They must abstain from sexual relations and meat, similar to the fasts taken by many shamans to enter a higher spiritual plain. Cultivating manioc and brewing chicha are traditionally the realms of women, and some anthropologists describe it as an analogous version of the sacred rites exclusively practiced by men. Christine Hugh-Jones extensively studied the role of manioc and chicha in the Barasana culture of Colombia and found that the cycle of manioc preparation mirrors the ebb and flow of human life. Sacred chicha rituals echo the rhythms of social interactions, endowing them with significance.

This has been the historical role of brews in Western cultures as well, although many of us have forgotten the healing and sacred properties of our own beers. Modern people taken aback by the idea of "sacred booze" would do well to remember that our brews were only recently secularized. Long before they became sterile commodities, they served as medicine and sacrament. These traditions are still preserved in a handful of our cultural institutions: the sacramental wine of Catholic Mass and Passover feasts, for instance, and the strong ales still brewed by Trappist monks.

OK, BUT WHY ALL THE CHEWING AND SPITTING?

"All right," some readers may be thinking, "so manioc has cultural significance. Why chew it and spit it out, though? Is this just some superstitious ritual?"

Although the chicha brewing tradition is couched in the language of the mythic and the supernatural, it is actually an example of ancient chemistry, developed over centuries of trial and error.

Modern scientists have studied the chemical reactions that take place during this process. Human saliva is a great source of amylase, an enzyme that also aids in our digestive process. When a person chews a starchy plant such as the manioc root, amylase converts starches and complex sugars into simple, fermentable sugars, just as it does when mashing malted grain. Through test and observation, humans discovered a simple, readily available way to process fermentable sugars.

This was the same ancient practice that Rex and I engaged in when we sat in his San Diego backyard and prepared our first batch of chicha. To add authenticity, I had brought along a CD of *The Spirit Calls*, a Smithsonian collection of traditional native music from the rainforests of South America.



The process was laboriously slow. My CD played three times in a row, and we had barely made a dent in our pile of cooked manioc. We put on some modern music, had a few homebrewed IPAs, and kept chewing. The bland, starchy taste of the tubers filled my mouth and my soul. By the fourth hour of chewing, I felt that I had gone outside of time itself.

Finally, we had finished. Never had I been so thankful for the accoutrements of modern brewing: the mash tun, the brew kettle, the glass fermenter. The rest of the process seemed to fly by, compared to the tedious chewing.

I took a whiff of the steaming mash as it cooked. It had a familiar smell to it, especially because we had added in a small amount of malted barley to aid in starch conversion (see recipe for several brewing options). The absence of hops gave it a crisp, clean scent, albeit without the overbearing sweet aroma of a malty beer. The vapor emanating from the pure starchy tubers was clean, almost odorless.

After we cooled the manioc wort, I thanked Heaven for our readily available Belgian yeast. Fermentation can be considerably messier in the Amazon. To develop yeast, some communities in Brazil, Colombia, and Venezuela will spread moist manioc on the floor of the communal home. They cover it with ash and leaves, and let the villagers walk across it for a few days until mold grows on it. I'll take some good old White Labs yeast any day.

After a week of fermentation, Rex and I bottled our chicha, adding a small amount of sugar for carbonation. While this step is not culturally authentic, we were sensitive to the Western palates of our friends and families. The British naturalist Charles Waterton explored the Guianas in 1820 and tried a taste of the local chicha. He described it as "an abominable, ill-tasted, and sour kind of fermented liquor." We were willing to make a few concessions to modernity to avoid receiving similar reviews.

The end result was a very crisp, clean-tasting beer, with a slight residual sweetness. Rex gave a bottle to his friend without describing the ingredients to her. After she had consumed a glass, he said with a grin, "That's my spit. So basically, it's like you and I just made out." The woman grimaced.

"You might want to stop saying that every time you give someone a bottle," I suggested.

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IS IT SAFE?

If drinking another's saliva was unappealing back then, in the pre-COVID-19 world, it has become even less appealing nowadays. However, the chicha brewing process is quite safe, with respect to both natural cyanide toxins and human pathogens.

I consulted with several MDs and nurses, and all assured me that boiling a liquid would kill any viruses it might contain, including SARS-CoV-2. I contacted the Centers for Disease Control and Prevention for an official comment but received no reply (I suppose they have better things to worry about than spit beer). While the boil should neutralize both the hydrocyanic acid and any pathogens, it's understandable that many will still be wary about drinking saliva any time soon.

Allow me to offer an alternative suggestion, though.

At some point in the future, the world will start going back to normal. Enough people will be vaccinated that we'll reach herd immunity, and we'll go back to worrying about such mundane afflictions as heart disease and diabetes. The day when we can all go back to hugging and kissing each other will be a cause for celebration indeed.

What better way to celebrate community and togetherness than by drinking chicha, a brew that has held Amazonian societies together for millennia? And what better way to celebrate herd immunity than by drinking another person's fermented spit?

Through chicha, the magic of brewing and community can have the last word after all. In your face, COVID-19.

Many thanks to Rex Garniewicz, who turned his California backyard into an Amazonian jungle back in 2013. I am also indebted to Linda Mowat for much of the cultural information in this article. Her book, *Cassava and Chicha: Bread and Beer of the Amazonian Indians* (Shire Publications LTD, 1989), is an excellent overview of manioc and its uses in the Amazon.

David J. Schmidt is an author, homebrewer, and multilingual translator who splits his time between Mexico City and San Diego, Calif. Schmidt speaks 12 languages and has spent the past 15 years traveling throughout rural Mexico, Latin America, and Africa in search of ancient folk brews, making him a veritable Indiana Jones of home brewing. (Think Harrison Ford with a beer gut.) He can be found on Facebook, YouTube, and Twitter with the handle "Holy Ghost Stories," or via the website www.HolyGhostStories.com.



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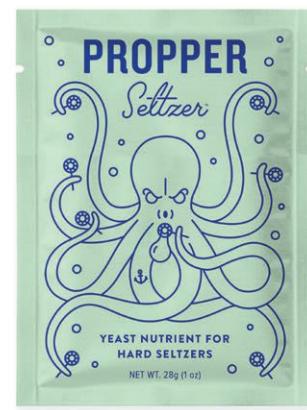
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Relax, Don't Worry, Have a Homebrew!



That mantra rings as true today as it did in 1978 when Charlie Papazian cofounded the American Homebrewers Association with Charlie Matzen. Homebrewing can be as simple or as complex as you want to make it, but the first step is always to relax and not worry.

To aid your relaxation and help you get the most out of *Zymurgy*, here are some standard assumptions and methods for our recipes. Of course, when a recipe says to do something different, follow the recipe. But you can always fall back on these general tips to brew great beer.



ON THE WEB

For more detailed info, head over to HomebrewersAssociation.org and dive into our How to Brew resources.

BREWING WITH ZYMGURGY

MAKING WORT

Most recipes in *Zymurgy* offer an all-grain version and a malt extract or partial-mash alternative. Pick the procedure you prefer and prepare some wort! Some recipes

might include a water profile. If you can't (or don't want to) deal with water chemistry, don't worry about it: just go ahead and brew! Extract brewers needn't add minerals to water.



Malt Extract Recipes

Making wort from malt extract is easy.

- Crush specialty grains, if any.
- Place milled grains in a mesh bag and tie it off.
- Steep bag of grains in 150–160°F (66–71°C) water for 30 min. in your brew pot.
- Remove bag of grains from the pot.
- Fully dissolve extract in the hot, grain-infused water (if there are no specialty grains in the recipe, you can skip directly to this step).
- Top up with water to your desired boil volume. (Leave some room for foam!)

All-Grain and Partial-Mash Recipes

Unless otherwise specified, all-grain brewers can conduct a single-temperature infusion mash with these parameters:

- Water/grain ratio: 1.25 qt./lb. (2.6 L/kg)
- Mash efficiency: 70%
- Mash temperature: 150–153°F (66.7–67.2°C)
- Mash duration: 60 minutes

Partial-mash recipes make the same assumptions but use a smaller amount of grain and augment the wort with malt extract.

BOILING

No matter how you get here, everyone loves adding hops.



- Boil time is 60 minutes unless otherwise stated.
- Boils are assumed to be the full batch volume, but you can also boil a concentrated wort and top up with water in the fermenter.
- Hop additions are given in minutes before the end of the boil.

Brew Lingo

Every field has specialized language, and homebrewing is no different. Here are some of the key terms, abbreviations, and acronyms you'll find throughout Zymurgy.

AA – alpha acid

ABV – alcohol by volume

AHA – American Homebrewers Association

BBL – US beer barrel (31 US gal or 117.3 L)

BIAB – brew in a bag

BJCP – Beer Judge Certification Program

Chico – American ale yeast, AKA Wyeast 1056, WLP001, SafAle US-05, and others

CTZ – Columbus, Tomahawk, and Zeus: interchangeable high-alpha-acid hops

DME – dry malt extract

DMS – dimethyl sulfide, an off flavor similar to canned corn or cooked vegetables

DO – dissolved oxygen

EBC – European Brewing Convention (beer color)

FG – final gravity

FWH – first wort hops, added to the boil kettle as it fills with sweet wort after mashing

HERMS – heat exchange recirculating mash system

HLT – hot liquor tank

IBU – international bitterness unit

LHBS – local homebrew shop

°L – degrees Lovibond (malt color)

LME – liquid malt extract

LTHD – Learn to Homebrew Day

MLT – mash-lauter tun

NHC – National Homebrew Competition

OG – original gravity

°P – degrees Plato (density of wort or beer)

RIMS – recirculating infusion mash system

RO – reverse osmosis, a water purification process that removes most dissolved ions

SG – specific gravity (wort/beer density)

SMaSH – single malt and single hop

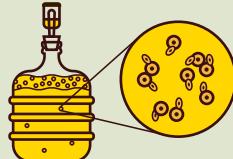
SMM – S-methyl methionine, precursor to dimethyl sulfide (DMS)

SRM – Standard Reference Method (beer color)

FERMENTING & CONDITIONING

Pitch yeast into chilled, aerated or oxygenated wort.

- Use twice as much yeast for lagers as you do for ales.
- Ales ferment at 60–70°F (15–20°C). Lagers ferment at 45–55°F (7–13°C).
- Condition ales at room temperature or colder for a week or two.
- Condition lagers at close to freezing for several weeks if you can (traditional but not required).



BOTTLING & KEGGING

If you bottle,

- Use 1 oz. of dextrose (corn sugar) per gallon of beer (7.5 g/L) for a good, all-purpose level of CO₂.
- Use less sugar for less fizz.
- Take care with higher carbonation levels—many single-use beer bottles aren't designed for high pressure.



If you force carbonate in a keg,

- Use the chart to dial in the gauge pressure on the regulator.



- Add 0.5 psi (35 mbar) for every 1,000 feet (300 meters) you live above sea level.
- To convert psi pressures to mbar, multiply by 69.
- To convert volumes of CO₂ to g/L, multiply by 2.

REGULATOR PRESSURES (PSI) FOR VARIOUS CARBONATION LEVELS AND SERVING TEMPERATURES

TEMP (°F)	VOL. CO ₂										
	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
33	5.0	6.0	6.9	7.9	8.8	9.8	10.7	11.7	12.6	13.6	14.5
34	5.2	6.2	7.2	8.1	9.1	10.1	11.1	12.0	13.0	14.0	15.0
35	5.6	6.6	7.6	8.6	9.7	10.7	11.7	12.7	13.7	14.8	15.8
36	6.1	7.1	8.2	9.2	10.2	11.3	12.3	13.4	14.4	15.5	16.5
37	6.6	7.6	8.7	9.8	10.8	11.9	12.9	14.0	15.1	16.1	17.2
38	7.0	8.1	9.2	10.3	11.3	12.4	13.5	14.5	15.6	16.7	17.8
39	7.6	8.7	9.8	10.8	11.9	13.0	14.1	15.2	16.3	17.4	18.5
40	8.0	9.1	10.2	11.3	12.4	13.5	14.6	15.7	16.8	17.9	19.0
41	8.3	9.4	10.6	11.7	12.8	13.9	15.1	16.2	17.3	18.4	19.5
42	8.8	9.9	11.0	12.2	13.3	14.4	15.6	16.7	17.8	19.0	20.1

■ = PSI

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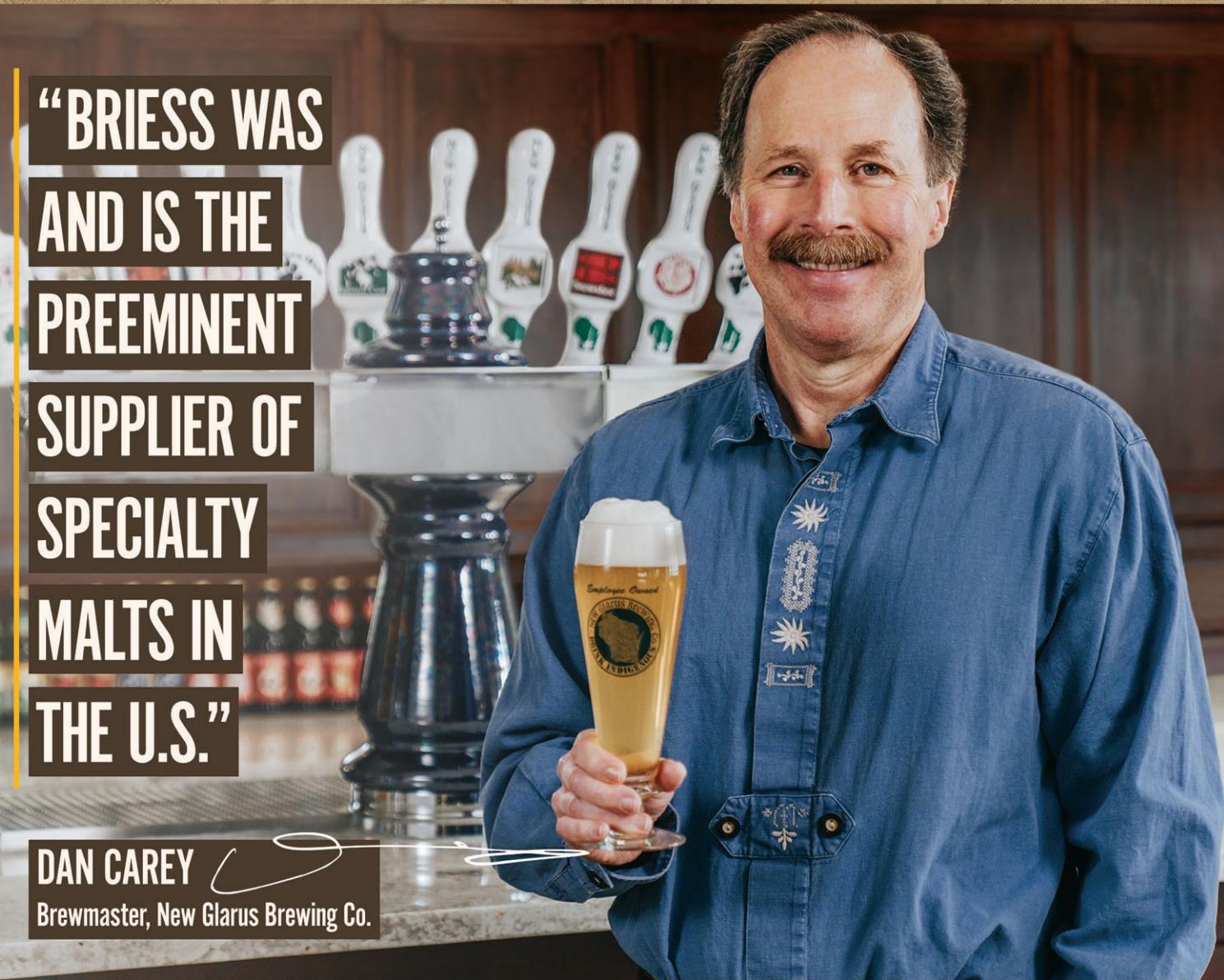
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"BREW THE BEER I DRINK"

On a Saturday in January 1995, at the ripe old age of 44, I brewed my first beer. I had just received a basic brew equipment and recipe kit from a local homebrew shop as a Christmas gift. Using the two-page instruction sheet and a third-edition copy of Charlie Papazian's *The New Complete Joy of Homebrewing* that were included in my kit, I brewed an-all extract Irish stout. The result was quite satisfactory and launched an enjoyable 26-year hobby of making my own beer..

By Rich Toohill

I joined my local homebrewing club, MUGZ (Mississippi Unquenchable Grail Zymurgists), to take advantage of a 10 percent discount on supplies from the homebrew shop. It wasn't until the unexpected death of my first wife in 1998 that I started to attend MUGZ meetings. By interacting with members, most of whom were all-grain brewers, I began my journey in that direction.



Homebrewing into the Golden Years



I moved my brew days from the kitchen to the garage and constructed a brew stand from an old steel entry door, which I cut in half and fashioned into a two-tier rack with two-by-fours. I purchased a used Sabco mash tun/boil kettle, relied on gravity wort flow, and used an immersion wort chiller. With a 15.5-gallon (59-liter) capacity, I was able to double my production with little more investment of time.

In 2002, vocational welding students at the local high school where I taught fabricated a more compact brew rack for me, complete with casters and built in-burners based on my design. While the rack was easier to move and use, the brew process remained pretty much “old school” in terms of transferring water and wort. Never one to spend lavishly on my hobby, and being fairly hale and hearty, I never invested in pumps, continued to do a lot of heavy lifting, and used a ladder to fill the hot liquor tank on the second tier.

I continued to brew in this fashion for the next 13 years. At age 65, during my annual health physical, my doctor lectured on the dangers of falling for senior citizens, noting that it was the number-one cause of disabilities for aging folks like me. I began to think more earnestly about how I could make my brew day safer so I could continue to homebrew.

During that time, I found 10-gallon (37.9-liter) batches less appealing (too much of a good thing) and realized that smaller batches permitted more variety throughout the brew year. So, I reverted back to 5-gallon (18.9-liter) brew days. While this change lightened the lifting somewhat, the need for different equipment seemed to be the next logical step, so I invested in a lighter 10-gallon mash tun.

The next year, I won a 10-gallon boil kettle at a homebrew competition raffle. I began to filter water directly into the hot liquor tank and mash tun rather than filter water in my basement, carry 5-gallon containers up to the garage, and climb a ladder to fill the hot liquor tank. My brew day was getting a bit easier and a lot safer.

However, one thing still bothered me. Carrying full 5-gallon glass carboys from the garage and down my basement stairs was the most dangerous part of my brew day—definitely a major falling hazard. I began thinking of ways to eliminate this danger. Why not move the brewery to the basement? I suggested to my second wife that perhaps it was time to invest in an electric brewery in the basement. In discussing the costs, she quickly responded, “Why don’t you just buy beer?”, which is an idea with substantial merit, as we have

18 craft breweries in our area with two more on the horizon.

She was, however, missing the point from my perspective. I would miss the joy of engaging in a hobby from which I had derived great pleasure over the past many years. There is something to be said about the quiet planning of a brew and the brew day. To me, it is an opportunity to get away from the everyday world. I genuinely look forward to brew day, and I find that it has a relaxing rhythm of its own that is unlike any other that I’ve experienced. Perhaps most of all, I would miss sharing of the fruits of my labor with friends, acquaintances, and fellow homebrewers.

Weighing my options, I considered brewing on a smaller scale. Some fellow homebrewers suggested eliminating glass carboys and fermenting in modified corny kegs instead. That would eliminate the danger of dealing with broken glass, but I didn’t see it greatly reducing the chance of falling. Both options meant less than 5 gallons of beer with the same investment of time.

Autumn of 2019 found me preparing for knee replacement surgery. I brewed my last batch in August of that year, and by November, I had cleaned and stored my brewing equipment. During rehab following my surgery in December, I had time to plan for my return to homebrewing. With the pandemic outbreak in March 2020, the need became more apparent, as I knew it would be a while before I could safely visit local breweries.

Sometimes the easiest solution to a problem is right in front of us. I decided on two changes to address the glass carboy and falling dangers. The first was to split the

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Brew
This!



Summer Wheat

American wheat beer

Recipe courtesy of Rich Toohill.

My journey into homebrewing and the desire for different styles of beer started in the late 1970s. During a trip to Canada, I developed a liking for the draught version of Guinness that was brewed there and distributed widely.

Back home, my search for “different” beers mostly centered around trying regional lagers that were not distributed in our area. The fabled desire for Coors was epic, as it wasn’t to be found in Iowa. Our glee when Olympia and Stroh’s began local distribution! The brief fascination with malt liquor!

The occasional Harp, Heineken, and Carlsberg did offer some variation to the standard American lager fare. One could find other German imports if you were willing to pay the price and withstand the skunk associated with those products.

My real awakening with craft beer began with the opening of Front Street Brewery in Davenport, Iowa, in 1993. Their Raging River was my first experience with pale ale, and it was an eye opener for my beginning to understand the diverse styles of beer that existed in the world. Still, finding those styles in Davenport was limited.

I had heard that one could buy kits and make some of these different styles of beer at home, and I mentioned to my first wife that I was going to explore brewing beer. She beat me to it and surprised me with equipment and an ingredient kit for Christmas.

My early homebrews were stouts, brown ales, ambers, and reds. My second year, I brewed a pale ale. Around that time, I attended a live music event in downtown Rock Island, Ill., which is across the Mississippi River from Davenport. The usual suspect lagers were for sale on the plaza, so I ventured into Rock Island Brewing Co., which is not a brewery, but a pub and eatery named after a historical brewery in Rock Island.

The bartender, John Hovarth (who still pours beers at Radicle Effect Brewworks in Rock Island), commanded multiple taps, many of which poured craft beers from around the country that weren’t available in local stores. One he suggested was Bell’s Oberon. I asked about the style and was dumbfounded when he told me it was a wheat beer. My ignorance of beer styles was evident when I said, “I didn’t know they made beer from wheat.”

As the years passed, I tried my hand at crafting hefeweizen, dunkelweizen, and my favorite style, witbier, which I have brewed multiple times. In 2017, I brewed my first American wheat beer. Simple and straightforward, Summer Wheat has become my go-to summer beer.

wort into two fermenters. The second was to switch to plastic carboys with carrying straps. Both changes significantly reduced the weight I carry and were not expensive modifications. Can I still fall? Yes, but I’m much less likely to do so.

I brewed my first post-surgery batch on Big Brew day in May 2020 and subsequently brewed five more batches into the summer and fall. I turn 71 years of age this year. Being able to continue to homebrew is truly golden!



Batch volume: 6 US gal (22.7 L)

Original gravity: 1.043 (10.7°P)

Final gravity: 1.005 (1.3°P)

Color: 4 SRM

Bitterness: 23 IBU

Alcohol: 5% by volume

MALTS

6 lb. [2.72 kg] pale ale malt

6 lb. [2.72 kg] white wheat malt

1 lb. [454 g] rice hulls

HOPS

1 oz. [28g] Cascade, 4% a.a. @ 60 min

1 oz. [28g] Fuggle, 5.2% a.a. @ 20 min

0.5 oz. [14 g] Liberty, 4% a.a. @ 0 min

YEAST

2 sachets Fermentis SafAle US-05

BREWING NOTES

Mash at 152°F (67°C) for 60 minutes. Boil 60 minutes, adding hops as indicated. Ferment at 67°F (19°C). Carbonate in keg with 2.6 vol. (5.2 g/L) CO₂.

EXTRACT VERSION

Replace the malts and rice hulls with 8 lb. (3.63 kg) wheat liquid malt extract. Fully dissolve the malt extract in hot water, top up with additional water to desired boil volume, bring to a boil, and continue with recipe.

Rich Toohill is a Certified BJCP beer judge and past officer of the Mississippi Unquenchable Grail Zymurgists (MUGZ). He organized the Land of the Muddy Water homebrew competition in 2009 and 2010. Rich lives in Davenport, Iowa.

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Prickly Pear Mead

A HOMEBREWER'S FORAGING ODYSSEY

It's Charlie Papazian's fault that I started on this odyssey. In *The Complete Joy of Homebrewing*, Charlie describes Prickly Pear Cactus Fruit Mead, which seemed like a fun challenge to this winemaker and brewer. So, my brewer buddy Bill Ridgely and I went to a patch of prickly pears that we discovered on a recent hike.

Predictably, our first attempt turned out to be a disaster. I created a monstrous, overflowing glob of snot that attempted to take over my basement. It was quickly dumped in the woods. Bill had a similar experience.

A few years later, I discovered a patch of prickly pears at a campground and decided to give it another try. I reread Charlie's recipe and discovered my error: you're meant to boil the prickly pears and ferment the resulting juice, not ferment the fruit itself.

An enterprising forager, I returned to the campground and dug up a few plants that had been selected for removal anyway. My son and I also salvaged some plants from an abandoned house when the coast was clear. We planted them five years ago in a sunny spot under my porch. Like the invasive species they are, the prickly pears spread under the porch but didn't flower and bear fruit until 2020.

I make my last wine and mead of the season every year around Halloween. This year, for the first time, I made mead from a blend of my own prickly pears and some I found in an undisclosed location (foragers do not reveal their sources).

The summer before, I had a table at a local farmers market, where I gave out samples of my handcrafted wine to attract clients and encourage them to make their own. I had a few apprentices for grape and prickly pear wine. I enjoy making lots of wine, but I can't consume it all.

However, I needed a source for a gallon of honey to make three gallons of prickly pear mead. At a local meadery, I bartered bottles of my tej (Ethiopian-style mead), prickly pear mead, and dried prickly pears (plus instructions for making prickly pear



Pictured are Ralph Bucca, Pam Showell, and JoAnn Immanuel.

mead) for a bucket of wildflower honey—a fair exchange that came with a promise for a return visit to compare products.

I had saved about 100 fruits in a refrigerator for this occasion. Wearing gloves and using tongs, I cut up the pears and slow cooked them for an hour in two pots over camp stoves outside on a cold, windy December day. After I removed the prickly pears, I added 9 pounds of honey to the cook pots and simmered it for 30 minutes. Then I poured the 1.085 must into a primary fermentation bucket and pitched Premier Côte des Blancs yeast the next day.

Three weeks later, I racked the mead to a 3-gallon carboy to condition until bottling in the spring. When I take my prickly pear mead to the meadery, I look forward to comparing it with theirs. Methinks Charlie would be amused by my prickly pear mead odyssey.

Ralph Bucca is a Lifetime AHA member, a founding member of Brewers United for Real Potables (BURP), and a zymurgist for all things fermentable. As a volunteer with the Farmer2Farmer program, he has had the opportunity to sample tonto, palm wine, chicha, and many other unique beverages in developing countries.



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