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MARCH/APRIL 2021

VOL 44 • №2

THE MAGAZINE OF THE AMERICAN HOMEBREWERS ASSOCIATION

HomebrewersAssociation.org

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NEW!
JANUARY 2021

IT'S JUICY. IT'S HAZY. IT'S WICKED.

SAMUEL ADAMS

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EDITOR'S *Desk*

BY DAVE CARPENTER

Fuel Stop

January 18, 2021, was important for a number of reasons. First, it was Martin Luther King, Jr., Day and an opportunity to reflect on Dr. King's legacy. Second, it was a day off work, owing to the aforementioned observation of Martin Luther King, Jr., Day. Third, and most relevant to this particular yarn, it was the first time I put fuel in my vehicle's tank in 2021.

Gassing up the car isn't an occasion I'd normally mark, much less write about, but thanks to COVID-19, I'd last engaged in this essential automotive ritual on October 29 of the prior year. Without a commute (or, let's face it, anywhere to go, really), there'd been little need to drive, which is how I managed to make it nearly a quarter of a year without refueling.

On this particular day, though, I needed to make a propane run in anticipation of an upcoming brew day. COVID-19 had forced limited, socially distanced happy hours into the backyard and, consequently, the patio heater had depleted the gas supply I normally used for making wort. So, I loaded the propane cylinders into the car and started the engine, which is when the fuel gauge alerted me that propane wasn't the only fossil fuel in need of replenishing that day.

My usual propane supplier, which also happens to be a gas station I visited with some frequency prior to COVID-19, had plenty of fuel on hand for cars, but to my surprise, they'd run out of propane, a phenomenon I'd never witnessed in more than a decade of homebrewing. I assumed there must have been a run on propane—and, one imagines, propane accessories—due to increased demand from outdoor diners. So, after successfully topping up the car, I headed out to the farm-and-ranch supply store to top up the propane tanks.

As it happened, the farm-and-ranch supply had plenty of propane. Brew day could happen after all.

My previous batch had been a parti-gyle brew that yielded a peat-smoked wee heavy of around 1.095 original gravity and a peat-smoked Scottish export of around half that. It was my first time doing a parti-gyle, and it was much simpler than I'd expected.

Anyone who knows anything about entering competitions will remind you that peat-smoked malt is out of place in Scottish-style ales—the BJCP is famously vocal on this point—but I don't brew for competitions. I brew for myself, and I adore a good Islay whisky (Lagavulin and Ardbeg are always welcome in my house), so my Scottish-style ales always feature a wee bit of peat-smoked malt in the grist. Not much, only about two percent or so. But it comes through nicely if you're into that sort of thing.

My next project is a series of Trappist-inspired ales, each of which makes use of yeast harvested from the previous one in the queue. The initial batch, and the one that prompted the propane run that's to blame for this whole story, was split between a Belgian blonde ale and a saison—one wort divided into two fermenters and pitched with two different yeasts.

By the time you read this, those two Belgian-style ales will have finished chugging along and should be about ready to keg and bottle if I haven't already done so (if you're the betting type, wager that I haven't). I won't harvest the saison yeast, but the blonde ale will contribute increasing populations of (purportedly) Westmalle cells to an upcoming dubbel, tripel, and dark strong ale, in that order.

Homebrewers brew for many reasons and in different ways. Some are experimentalists who like to tinker and answer elaborate what-if questions. Some are scientists who value repeatability and take meticulous notes on every aspect of the brewing process. Others are artists who brew by the seats of their pants.

As for me, I go for the tried and true. I settle on a recipe I like, and I brew it. Sometimes I take notes. Often I don't. Every now and then I'll mess around with the choice of yeast, swap out a malt to accommodate what I have on hand, or take a process shortcut if I'm running out of time. But, I tend to maintain a library of recipes I know and like, and I brew those more often than not.

So what's next after my monastic-style series? By that time, hot weather will be at our doorstep, which'll have me thinking about pale lagers. If I plan ahead, I might even knock out a Märzen to lager all summer long and serve in the autumn, when maybe, just maybe, things will have started getting back to normal.

What about you? What's next on your to-brew list? Whatever it is, call ahead to make sure you can get propane.

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

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Features

28

BREWING CLEAN BEERS WITH KVEIK YEAST

Farmhouse brewers in Norway use kveik to make traditional beers using unique processes. However, some yeast labs have identified and isolated several clean-fermenting kveik strains that brewers are using to turn out clean, lager-like beers.

By Ryan Pachmayer

36

FEST TEST

Debates around using ale yeasts and hybrid yeasts to brew lager-like beers usually center around a yeast's ability to minimize phenol and ester character in the finished beer. In this experiment, two classic lager strains are pitted against two kveik yeasts.

By Brady Smith

42

AN EXPERIMENT WITH BARLEYWINE

Scottish ale yeast is a classic for barleywine, but how do others stack up? In this experiment, the authors compare the old standby to Nottingham, Thomas Hardy, saison, and even Trappist-style yeasts.

By Chris Pinnock

54

WOOD YOU LIKE SOME APPLES?

It's only natural to consider oak for adding tannins and vanillins to our homemade ciders. But is there a better choice of wood, or is oak really the standard for a reason? See how it stacks up against pecan and mesquite.

By Scott Kurtz

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Columns

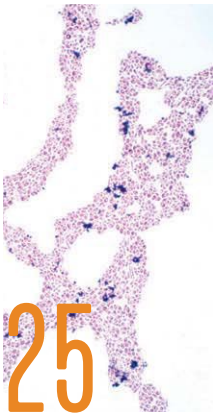
3 **EDITOR'S DESK**
Fuel Stop

By Dave Carpenter

72 **LAST DROP**
Scorched Earth, a Smoked American Red Ale

By Ryan Kriesch

Departments



8 **NOW ON TAP**

13 **DEAR *ZYMURGY***

19 **YOU CAN FERMENT THAT!**

25 **BEER SCHOOL**

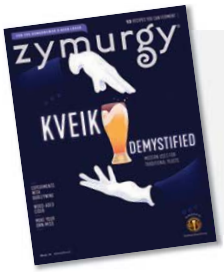
62 **RELAX, DON'T WORRY, HAVE A HOMEBREW!**

65 **FERMENT ON THIS**

71 **ADVERTISER INDEX**

Recipe Guide

Scorched Earth 11
Sweet White Miso 21
Savory Red Miso 22
Lutroberfest Ale 26
A Kveiking We Will Go 27
Fjords to Valhalla 31
Hellya Blonde 32
Skarkey American Pilsner 34
Von Steuben Festbier 41
County Barleywine 51
Basic Cider 56
Imperial Cinnamon Spiced Cider 60
Yumm! 66



Cover Illustration
Diana Bolton

Vol 44 • No. 2
March/April 2021

zymurgy

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

ON THE WEB
Find these homebrewing recipes and more on our website @ HomebrewersAssociation.org/homebrew-recipes

NOW ON *Tap*

New Product

ANVIL CRUCIBLE FERMENTOR

When many of us started homebrewing, the idea of fermenting in a stainless-steel conical seemed like a distant dream. Stainless was much more expensive than a plastic bucket or glass carboy, and maybe we (or our partners) weren't even sure if this whole homebrewing thing was just a passing interest or something that would stick.

You know where this is headed. You break a carboy here. You get an infection there. You tire of siphoning, and at some point that stainless starts to look more reasonable. It doesn't hurt that manufacturers started offering attractively priced stainless conicals that are within the reach of a wider range of homebrewer budgets.

Enter the ANVIL Crucible Conical Fermentor, the newest addition to ANVIL's lineup of wallet-friendly brewing products. Available in 7-gallon (26.5-liter) and 14-gallon (53-liter) models, the Crucible line offers just the right amount of head space for 5-gallon (18.9-liter) and 10-gallon (37.9-liter) batches, respectively.

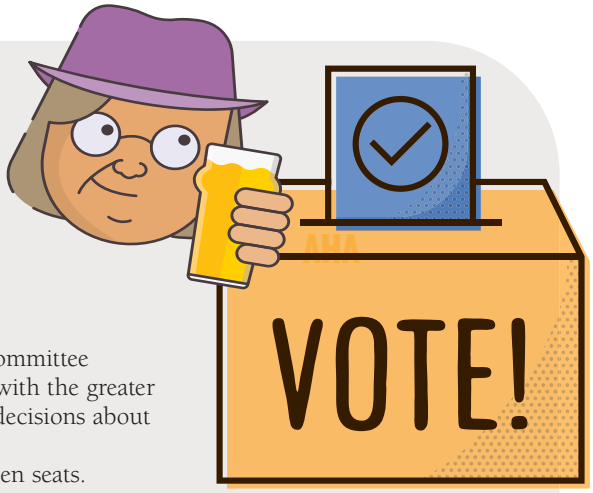
The Crucible is packed with great features. A rotating racking arm lets you pull clear beer and leave yeast and trub behind, while a 1.5" tri-clamp dump valve makes removing sediment and harvesting yeast dead simple. More modest details like internal volume markings and sturdy handles help make your brew day a bit easier.

The Crucible comes standard with an LCD thermometer, airlock, and stopper. An optional fermentation cooling system, yeast harvesting kit, and leg extensions are available separately.

The 7-gallon ANVIL Crucible Conical Fermentor retails for just $275, while the 14-gallon model runs only $325. Visit anvilbrewing.com to learn more!

AHA Elections

VOTE FOR YOUR GOVERNING COMMITTEE REPRESENTATIVES



All AHA members are requested to vote in this year's AHA Governing Committee election. The members of the Governing Committee connect AHA staff with the greater homebrewing community, provide AHA staff with guidance, and make decisions about the future course for your association.

In this year's election, eight AHA members are running to fill three open seats. Review the candidate statements on HomebrewersAssociation.org and cast your vote.

Many thanks to outgoing Governing Committee member Debbie Cerda! We all appreciate your service to the AHA and commitment to the homebrewing community. Current Governing Committee members Jen Blair and Sandy Cockerham are running for re-election.

Governing Committee members serve three-year terms, during which they participate in monthly conference calls, serve on topic-specific subcommittees, and take part in a half-day, in-person meeting each June at Homebrew Con (the 2020 meeting had to be virtual, though).

Find the online ballot at HomebrewersAssociation.org and cast your vote by March 31, 2021.

Thank you!

2021 Governing Committee Election

EIGHT CANDIDATES ARE RUNNING FOR THREE OPEN SEATS.

Your AHA Governing Committee develops member benefits and programs and provides direction for the future of the organization.

Jen Blair

Matt Bolling

Bruce Buerger

Sandy Cockerham

Malcolm Frazer

Christopher Frey

George Turner

J.B. Zorn

CAST YOUR VOTE BY MIDNIGHT ON MARCH 31

HomebrewersAssociation.org/vote

Homebrew Shop of the Year Award

Sponsored by: BSG HandCraft

The local homebrew shop plays an important role in our community, and not just as suppliers of ingredients and equipment. These small businesses serve as advocates for homebrewing and contributors to their local communities. Of the countless craft beer success stories today, how many started as aspiring homebrewers with a visit to their local shop?

The Homebrew Shop of the Year Award aims to recognize the integral role that homebrew shops play in the homebrewing community. All AHA members are eligible to nominate their favorite shop. If your go-to homebrew supply shop is deserving of recognition, take a few minutes to submit a nomination for the Homebrew Shop of the Year Award at HomebrewersAssociation.org/ShopAward. Members of the AHA Governing Committee evaluate all of the nominations and determine a winner.

The winner of the 2021 Homebrew Shop of the Year award will be announced at Homebrew Con on June 19.

YAKIMA CHIEF -HOPS- + AMERICAN HOMEBREWERS ASSOCIATION

Radegast Club of the Year Award

The AHA Radegast Club of the Year Award (a.k.a. the Awesome Club of Awesomeness Award) is all about showcasing what makes homebrew clubs awesome. Club nominations for the 2021 Radegast Club of the Year Award must be submitted by March 31. If you are a member of an awesome homebrew club, take this opportunity to share with the rest of us what your club is all about. Submit entries via the nomination form at HomebrewersAssociation.org. Entries will be judged by members of the AHA Governing Committee.

The winner of the 2021 Radegast Club of the Year Award will be announced this summer at Homebrew Con on June 19.

From the AHA Director

DREAMING OF HOMEBREW CON

HOME BREW CON 2021 — JUNE 17–19 SAN DIEGO, CA

AMERICAN HOMEBREWERS ASSOCIATION

A few weeks ago, my wife, Carolyn, leaned over and asked, "Can we go to Bermuda?"

It was a rhetorical question, really. We're not going to Bermuda anytime soon. We've been cautious during the COVID-19 pandemic. No flights. Holding kids out of day care. Working remotely. But letting ourselves dream of the way we hope the world will be in the future is, frankly, a relief from our current reality. Paradoxically, one of the best ways to dream is to plan the minutiae. So, we sat together and looked at vacation rentals, flights, beaches, and weird little electric cars called Twizys. (An Airbnb with a Twizy charging station is the way to go.)

Two hours later, we looked at each other and said, "That was fun."

We're coming up on a year of COVID living, and we all need to dream a little. Your American Homebrewers Association staff have been dreaming about the next time we can all be together at Homebrew Con. We are still holding out hope for June 17–19 at the Town and Country in San Diego, and we're deep in the details of reviewing the proposals for seminars. If it turns out that we can't safely get together in San Diego, we'll be ready to host the second annual Homebrew Con online.

So, take a moment right now to dream about San Diego in June at the Town and Country. It's been remodeled since we were there in 2015, so it's a little more modern, but it's still the same sprawling oasis that feels like it was built just for us: a three-day weekend homebrew fantasy getaway where you can almost forget the rest of the world exists. Like Bermuda. Or at least the Bermuda of my dreams.

The point is, even if the dream doesn't come true just yet, it gives us a little escape today and helps us look forward to tomorrow. So, think about your last Homebrew Con and say it with me: Club Night, Club Night, Club Night. As your editor, Dave Carpenter, says, it's "the only place in the world where you expect to drink beer tapped from a cow's udder."

Cheers, Ryan Farrell

Brew This!

Scorched Earth

Rauchbier-style ale

Recipe courtesy of Ryan Kriesch.

This is not a traditional Rauchbier recipe. For one thing, we're using an ale yeast, and furthermore, there's no lagering. If you'd prefer to brew this as a more traditional lager, use Wyeast 2308 Munich Lager yeast. Or, for a clean ale, try Wyeast 1007 German Ale Yeast.

Drink this within a couple of months for more smoke character—the smoke fades as it ages. It's also great for culinary experiments. See Last Drop on page 72 of this issue of *Zymurgy* for background.

Batch size:	5.5 US gal. (20.8 L)
Original gravity:	1.056 (13.8°P)
Final gravity:	1.017 (4.3°P)
Efficiency:	70%
Color:	15 SRM
Bitterness:	35 IBU
Alcohol:	5.5% by volume

MALTS & ADJUNCTS

6.7 lb. (3.03 kg) Briess Cherry Wood Smoked Malt
4.3 lb. (1.96 kg) Briess Ashburne Mild Malt
9.0 oz. (255 g) Aromatic Malt
7.0 oz. (200 g) Briess Caramel/Crystal Malt, 120°L
2.0 oz. (57 g) Weyermann Chocolate Rye Malt

HOPS

1.0 oz. (28 g) Palisade, 7.4% a.a. @ 30 min
1.3 oz. (37 g) Palisade, 7.4% a.a. @ 10 min
1.0 oz. (28 g) Fuggle, 4.7% a.a. @ 0 min

YEAST

Wyeast 1469 West Yorkshire Ale

BREWING NOTES

Mash 75 minutes at 153°F (67°C), followed by a 10-minute mash-out at 170°F (77°C). Lauter, sparge, and collect wort. Boil 60 minutes, adding hops as indicated.

Chill wort to 68°F (20°C) and ferment at that temperature until terminal gravity is reached. Package in kegs or bottles as you prefer.

Melissa McCann

Women's International Beer Summit

It began in autumn of 2020, when questions for holding beer competitions were many and solutions few. Melissa McCann, director of Queen of Beer, the oldest all-female homebrew competition in the United States, reached out to a few of her favorite people in the beer industry and tossed around some ideas for encouraging women to keep brewing and keep learning—from there, the beer summit idea was born.

But, Melissa didn't just want an educational event. She also wanted something that would inspire and encourage. At the same time, she wanted to support SheBrewPDX, the other premier female homebrew competition in the US. With SheBrewPDX on board, the Women's International Beer Summit team was formed.

This virtual event will be a global summit to celebrate the craft of beer, mead, and cider. Melissa says, "The goal is to provide informative, encouraging, and inspiring content that will keep our greatest brewers creating! With interactive opportunities, we want to inspire people to learn new ideas and create even better beers, meads, and ciders. We have encouraging speakers with incredible stories to inspire our attendees to think bigger about their craft and their careers. Our plan is to not only reach the homebrew community, but also the women of the professional industry."

Everyone is encouraged to attend. One fee provides access to all events, while an optional add-on package provides product samples for an even greater interactive experience. Scholarships and other prizes—including two tickets to Homebrew Con courtesy of the AHA—will be given away, too.

The Women's International Beer Summit is presented by BSG and empowered by the AHA. Plans for the Summit are currently underway—to stay up to date, visit QueenofBeer.beer or SheBrew.beer, and follow the Summit on social media (Instagram: QueenofbeerCompetition and ShebrewPDX; Facebook: Queen of Beer Competition and SheBrew) for opportunities to win prizes, including a Grainfather.

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Recipes for BIAB Brewers

There's Always Some Brewin' to Be Done

***Dear* Zymurgy,**
I thoroughly enjoyed reading Jeff Gaye's Last Drop article, "There's Always Some Brewin' to Be Done," in the Nov/Dec 2020 issue. I, too, am a dedicated brew-in-a-bag (BIAB) brewer. I use BIAB because of limited space, expense, and a desire to keep things simple. Any chance we will see any future recipes tailored for us dedicated BIAB brewers?

I really enjoy all of the articles; keep up the great work!

Bill Hail
Holt, Fla.

Zymurgy *editor-in-chief Dave Carpenter responds:* *Hey, Bill, good question. We tend to consider BIAB as a type of all-grain method rather than as a distinct recipe formulation. In other words, you should be able to adapt any of the all-grain recipes in* Zymurgy *to the equipment you use. Unless a recipe specifically calls out an efficiency value, you can assume 70% for anything we print. Then you can scale grain quantities according to your own efficiency and batch volume. Of course, you'll need to adjust water volumes as well, depending on whether you mash using the full volume of water or employ a sparge method.*

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

HOMEBREW LABEL SUBMISSIONS

This label combines the Flannery and Cruz family crests of my parents. I gave the concept and an incredibly crude Microsoft Paint drawing to a friend, who designed it and spruced it with one of my favorite cats, a Pallas's cat. Thanks to Meg Ryan Flanigan for designing and creating something I can't!

I've used this label for beers, ciders, and meads. The next ones it'll be on are a Mexican lager, a hefeweizen, and a braggot. Most recently, it's on a Berliner weisse and a strawberry cider.

Luc Flannery
San Diego, Calif.

THERE'S FUR IN MY BEER!

I wanted to show off my little princess brew dog Morgan. She's watching over the operations as a big imperial stout is in process here at Whole Nother Level brewing.

Cheers!
Jason Galea
Delmar, N.Y.

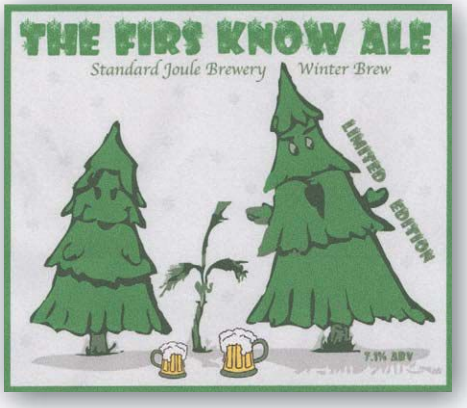
Brew pup Molly keeping an eye on the Czech Pilsner yeast starter.

Bob Nyman
West Sayville, N.Y.

Onix likes to oversee the final drain of grains after sparging. She prefers black IPA, Baltic porter, and this batch, my seasonal Krampus Kompanion black saison. When not eviscerating rats, she likes to soak up the hot Florida sun like her Bombay cat ancestors.

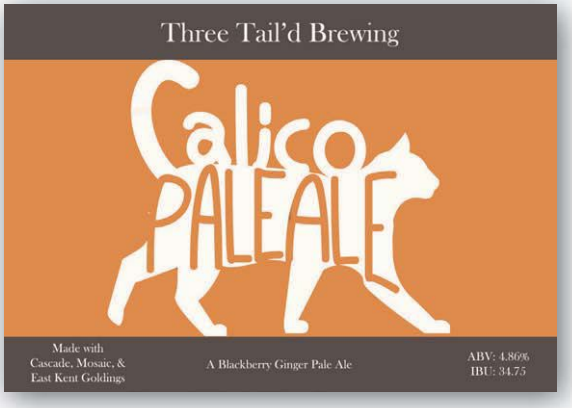
Tim Owens
Lakeland, Fla.

HOMEBREW LABEL SUBMISSIONS



A few years ago, I made several beers to give as gifts during the holidays. One of those was a Christmas ale. I had the idea for this label, and my daughter, who is very talented when it comes to graphics and artistic endeavors, realized the design.

Phil Strom-Jensen
Durham, N.C.



I recently started homebrewing as a new COVID-19 quarantine hobby and figured it would also be a good opportunity to hone some graphic-design skills while looking for a new job. My fiancée and I settled on the homebrewery name and beer name because we have three cats.

Calico Pale Ale, a blackberry ginger pale ale, was my first attempt at crafting my own recipe without a kit. The inspiration came from Canada Dry's Blackberry Ginger Ale. I developed the recipe using malt extract with steeped grains. While the flavors of the ginger and blackberries were not as pronounced as we had hoped for, we still were happy with the resulting brew and have received much positive feedback. I look forward to experimenting with the recipe to further hone the flavors!

Bernie Gurka
Turnersville, N.J.

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!

My four-legged buddy, the Artful Dodger, always has a smile on brew days, likely because he knows the spent-grain treats will shortly follow!

Cheers,
Tom Burlingame
Bloomfield, N.Y.

My first brew dog was my sheltie, Jake. He was a meticulous brew assistant and companion. He passed the torch to his successor, Kaia. She is learning the ropes quickly with her first brew, a Dogtoberfest! She thought a German-style beer was an appropriate inaugural brew.

Cheers,
Scott Pockl
Wheeling, W.Va.

Ethyl got caught trying to read the latest issue after napping in a carboy carrier, while Lucy is convincing me that she shouldn't have to help clean up after providing emotional support meows during bottling.

Greg Gawinski
Cicero, N.Y.

Willow, Loki & Audy

Brew dog Audy has been brewing with me for almost ten years. We recently lost her sister brew dog, Willow. This is the first beer (photo on right) that we have brewed since Willow's passing. She was a great assistant as well.

We are brewing a Belgian Trappist-style ale, a recipe from the local homebrew store. Something different, just like brew dog Willow (as Audy would say). Cheers to you Willow; you are greatly missed.

Michael Shapard
Hutto, Texas

Audy

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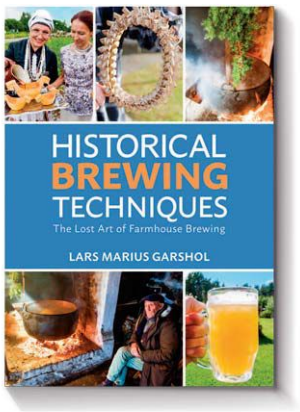

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MISO

By Amahl Turczyn

Miso is a fermented paste traditionally made with soybeans. As with sake, miso ferments with the help of koji, that magic culinary mold *Aspergillus oryzae*, grown on rice or barley. The cooked soybeans are mixed with koji and a percentage of salt to control fermentation and deter unwanted microbes, and then blended into a paste and left to ferment at room temperature.

Miso may be unfamiliar to many western people, but it is an absolute cornerstone of Asian cuisine, particularly Japanese, and it has all kinds of applications in the kitchen. Trained tasters of beer and other foods are familiar with the primary taste umami that comes from glutamates in products like beef, Marmite, and mushrooms. Well, miso is the holy grail of umami, and once you've fermented a batch, you'll soon find applications for it far beyond Asian cuisine.

Miso is perfect for enhancing soups, stews, and sauces of all kinds, but it isn't used by western chefs nearly as much as it deserves to be. You might be more familiar with tamari, which is a variant of shoyu (what we know as soy sauce)—tamari is a byproduct of miso fermentation, so you basically get two products from one ferment. It's particularly satisfying to harvest tamari off the surface of your fermenting miso, as it is delicious and gives you a good sense of how your miso is evolving. The presence of this richly flavored, salty brown liquid is also an indicator that your miso fermentation is progressing as it should.

Photo © Getty/hungryworks

Soaked soybeans ready for cooking.

Skimming the foam.

Soybeans will darken to a red color.

> “Miso is the holy grail of umami.

Reserved bean water after cooking.

Mashing cooked soybeans.

Pack the mashed miso into your fermenter.

Smooth the surface of the miso and sprinkle with salt.

Miso fermentation is not difficult, but depending upon what type of miso you want to make, it can be time consuming. For example, sweet white miso takes about three or four weeks to ferment, but the savory, mellow, slightly funky red miso that packs the biggest umami punch can take six months or more, depending on ambient temperatures and desired degree of fermentation. However, your patience will be rewarded with something truly unique and culinarily versatile.

Each batch comes out a bit different every time, as it is a product of your particular environment and locale, with flavors and aromas dictated by the fermenting microbes involved. It's also very good for you: many store-bought miso products are pasteurized, but there is no reason to kill off all those active enzymes and bacteria that are so good for your gut health, immunity, and digestion. Finished, home-fermented miso can stay in your fridge for years, no worse for the wear. As with many other fermented foods, you can take a bit from a previous batch to use for the next; this “seed miso” ensures some level of continuity. Plus, the more often you make miso, the more your technique will improve.

Producing your own koji rice or koji barley is an art in itself, but it requires fairly advanced techniques and specialized equipment. Fortunately, there are several readily available sources for this vital ingredient, and it's not particularly expensive. As with malted barley for brewing beer, you can theoretically make it yourself, but purchasing it ready made by the experts means your ferment has a much better chance of success. Rice koji is common for sweet white miso (short term); rice or barley koji are used for savory red miso (long term). Your koji producer should specify which is which, so read the description carefully. I've had success with koji produced by a Vermont company called Rhapsody Natural Foods, but there are many others out there.

Just be sure you are getting koji grains—another product called koji kin is basically just the mold spores without the grain. It's often marketed as a dry-aged beef product, as people can sprinkle a bit on a steak and, in about two days in the refrigerator, the *Aspergillus* will partially “digest” the meat, producing delicious umami glutamates that mimic a two-week dry age. However, koji kin is not suitable for producing miso by itself; you would first need to go through the steaming, cooling, and inoculation of the grain with the mold spores and hold the mixture at a specific temperature and humidity to get the mold to grow.

Soybeans for miso are pretty easy to find. Organically sourced beans ensure a pesticide-free miso. For either short- or

Photos courtesy of Amahl Turczyn

Ferment This!

Sweet White Miso

Yield:
3 lb. (1.36 kg), approximately

INGREDIENTS

8 oz. (227 g) organic soybeans
1 lb. (454 g) short-term koji rice
Carbon-filtered water, as needed to boil soybeans
1.5 cups (355 mL) cooking liquid from boiling the beans
3 Tbsp. (51 g) sea salt
3 oz. (85 g) seed miso from a previous batch (optional)

BREWING NOTES

Measure and wash the soybeans well in cold water, then cover them with a couple of inches of cold, filtered water and allow them to soak overnight. Drain, cover with another two or three inches of filtered water, and bring to a boil. Skim and remove any white foam that rises to the surface over the first 20 minutes of the boil. Then cover and boil until very soft, 3 to 5 hours. With a pressure cooker, the proper consistency can usually be reached within 2 hours.

When done, allow the beans to cool to 100˚F (38˚F). Drain off the cooking water and reserve in a large bowl. Measure koji rice into another container and hydrate with just enough of the cooled cooking water to moisten the grains. When soft, mix in the salt and seed miso, if using, then add the cooked beans and mash thoroughly.

Sanitize and salt your fermenter, then pack the bean paste into it, pressing out any air bubbles as you go. Smooth the surface, dust with a bit more salt, then cover with a fitted piece of clean cloth. Add a plate, dish, or lid to cover, then place a weight on top that's approximately the same weight as the miso.

Allow to ferment at room temperature for at least 3 to 4 weeks. When fermented, pack into a Mason-type jar with a lid and keep in the refrigerator for use.

long-term miso, you'll need to soak the beans overnight and then boil them until they are very soft—three to five hours might seem like overkill to achieve this, but it is a common boil time when making miso. A pressure cooker can reduce this time somewhat, but you want the beans so soft that they squash to a paste easily between your fingers.

Whatever you do, don't add the salt *before* you boil; if you do, the beans will remain firm and never reach the soft consistency needed. You just want pure water and beans for both the soak and the boil.

To get the intense brown-red color needed for red miso, you'll need to cook the beans even longer. They start out white after soaking, but eventually the cooking liquid turns a deep, dark red. You'll need to keep topping the beans off with water as they cook to keep them from burning while they develop their color.

When you first start to boil the soybeans, you'll notice a lot of pillowy white foam rise to the surface of the water. If left in the beans, this foam may cause digestion problems—it's a common technique with many legumes to skim off and discard this foam during the first 20 minutes or so of cooking, so be ready with a

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Cover the surface with a sanitized plate or, in this case, a sanitized plastic disc.

slotted spoon or the like. Then, when no more foam arises, you can cover the beans and let them cook down for several hours, only checking them occasionally to monitor the water level.

You'll also notice that the beans shed a translucent skin as they cook and soften, as do other legumes such as garbanzo beans. It is not necessary to remove these skins, but I often do anyway.

After the boil, let the beans cool down in their liquid to 100°F (38°F). Pour off the liquid and reserve it for later. Add the koji rice or koji barley to a separate bowl and add just enough of the bean cooking liquid to moisten the grains, about 1.5 cups of liquid per pound of koji grain (780 mL per kg). It usually takes about 15 minutes to fully hydrate the koji grains. Then, stir your measured salt into the wet koji grains and add that mixture to your cooked, cooled beans. If you have "seed miso" from a previous batch, now is the time to add it. A quarter to a third of a cup (60–80 mL) is plenty.

Next you need to mash the miso. Some people use a meat grinder, but a potato masher works, too. The consistency is up to you; you want all the ingredients well blended, but you can go smooth or chunky. I've actually used a hand blender at this point, which worked well until it overheated and seized, so just make sure yours is up to the task. The miso should end up as a thick paste, about the consistency of peanut butter. You'll need to add another cup or two (240–480 mL) of the reserved liquid for the larger volume of red miso, but try to keep the paste stiff enough to form into a ball.

Next, prepare your fermentation vessel. You can use a crock with a lid or a wide-

Miso fermenter with weight on top.

mouthed earthenware container. You'll be placing a weight on top of the fermenting paste to keep gas bubbles from forming, so make sure that's easy to do with your chosen fermenter. Sanitize the inside of the container by filling it with boiling water (or use a good homebrew sanitizer), and then drain it and sprinkle or rub the inside surface with sea salt and leave it to cool to 100°F (38°F).

Now you want to pack the blended or mashed paste into the prepared vessel. This was traditionally done by using your hands to form balls of paste and throwing them forcefully into the fermenter, but as fun as this sounds, the reason behind it is to make sure there are no air pockets in the paste. Press everything in thoroughly, keeping the inner sides of the vessel as clean as possible. Mold other than *Aspergillus* is now the enemy, especially for a long-term ferment, so you need to do everything you can to keep your miso mold-free from here on out.

Smooth the surface of the miso, and cut a piece of clean canvas, cheesecloth, or cotton hand towel to fit over the surface of the paste. Sprinkle the paste evenly with a little more sea salt, particularly around the edges, and then apply the cloth. As an extra precaution at this point, I use a small spray bottle filled with pure grain alcohol and lightly mist down the inside of the vessel above the paste.

Ferment This!

Savory Red Miso

Yield:
6 lb. (2.72 kg), approximately

INGREDIENTS

1.6 lb. (726 g) organic soybeans
1 lb. (454 g) long-term koji rice
Carbon-filtered water, as needed to boil soybeans
3.5 cups (828 mL) cooking liquid from boiling the beans
8 oz. (227 g) sea salt
6 oz. (170 g) seed miso from a previous batch (optional)

BREWING NOTES

Measure and wash the soybeans well in cold water, then cover them with a couple of inches of cold, filtered water and allow them to soak overnight. Drain, cover with another two or three inches of filtered water and bring to a boil. Skim and remove any white foam that rises to the surface over the first 20 minutes of the boil. Then cover and boil until very soft, 3 to 5 hours. With a pressure cooker, the proper consistency can usually be reached within 2 hours.

When done, allow the beans to cool to 100°F (38°F). Drain off the cooking water and reserve in a large bowl. Measure koji rice into another container and hydrate with just enough of the cooled cooking water to moisten the grains. When soft, mix in the salt and seed miso, if using, then add the cooked beans and mash thoroughly.

Sanitize and salt your fermenter, then pack the bean paste into it, pressing out any air bubbles as you go. Smooth the surface, dust with a bit more salt, then cover with a fitted piece of clean cloth. Add a plate, dish, or lid to cover, then place a weight on top that's approximately the same weight as the miso.

Allow to ferment at room temperature for 6 months, checking every month or so to remove tamari, if desired, and to check for mold growth. Use a cloth and a spray bottle of pure grain alcohol to clean the inside of the fermenter as necessary, sprinkling more salt around the edges to discourage mold growth. When fermentation is complete, pack into a Mason-type jar with a lid and keep in the refrigerator for use.

Cover the surface of the miso with a plate or hard plastic lid and add a weight—I use another crockery jar for this. You want the weight approximately equal to the weight of the miso, so if you don't have something heavy enough, you can fill the inner vessel with water. A large rock on the plate also works.

Cover the whole thing with a clean cloth or plastic wrap. Gases need to escape, but you want to prevent free access by airborne microbes that might potentially spoil your miso. Be sure to label the miso with the type and date of preparation, and leave it on a countertop at ambient temperatures for three or four weeks for white, or six months for red.

If you are making sweet miso, it should be close to done after a month's time. Check for wild yeast or mold growth—if some is present, don't panic. A few flecks of brown, yellow, or green mold, or whitish yeast, are fine: just scrape them off, make sure the miso smells good, and keep the weight on until you've reached the desired level of fermentation. If, however, you notice any red, black, or bright neon-colored molds, you should dump the batch and start over (this happens rarely, but these are pathogenic and potentially poisonous).

You can taste a little to determine if it's how you like it. Then you can begin using it as needed. Refrigeration is optional; just know the miso will continue to mature and evolve at warm temperatures, whereas cold will slow the ferment nearly to a halt. Scooping the paste into a Mason-type jar and loosely covering with a lid is the best way to store miso in the fridge. It will also drastically reduce any further chance of contamination by pathogenic microbes.

With red miso, the one-month mark is still early in the process. This is when you should begin seeing tamari seeping from the surface. You can harvest the liquid if you like and store it in a small jar or squeeze bottle for use in the kitchen. A syringe or turkey baster works great for this: just tilt the fermenter and remove what you need. Again, check for mold, use your nose, taste a bit if you'd like, and if everything looks good, you can let the fermentation go another month. Mark the six-month anniversary on your calendar; you should have a delicious, mellow, umami-rich red miso by that time.

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

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Kveik

The Next Past Frontier

By Ryan D. Kriesch

Many yeast suppliers currently produce kveik yeasts that have been sourced from different regions of Norway. Some labs are even isolating specific strains from blended cultures and making whole new possibilities available to homebrewers. Omega Yeast, Imperial Yeast, Bootleg Biology, The Yeast Bay, Propagate Lab, Lallemand, and White Labs all produce at least one kveik strain at the time of writing.

These novel Norwegian yeasts have become a new favorite among pro brewers and homebrewers alike, in part thanks to such yeasts' ability to ferment at heretofore unbelievably high temperatures—glycol chiller definitely not required. Most kveik strains can ferment as warm as 98°F (37°C) or higher, and as cool as 70°F (21°C). →

This is a game changer for homebrewers who live in the Southern states and other warm climates. In summer, those of us in the flyover states can just place the fermenter in the garage or on the back patio and say, "Have fun, my little yeasts—see you in a few days."

Kveik strains are incredibly versatile, and if you have not yet picked one up and played with it, I highly recommend doing so. Each kveik yeast has a story to tell.

EXPERT ADVICE

Without diving into the history of kveik yeasts (read Lars Marius Garshol's *Historical Brewing Techniques* for that), I thought it would be good to hear from those in the lab who are producing these unique strains. Thus, I spoke with representatives from Omega Yeast and Imperial Yeast about their offerings. I'll offer some highlights here, but if you have questions, don't hesitate to pick up the phone or fire off an email. They are more than willing to talk about kveik or any other yeast.

First of all, do not get in a big hurry to package your kveik beers. Give them some time, and let the yeast clean up after itself and flocculate out of suspension. Although kveik strains can quickly consume available sugars, they still need time to finish up, just like any other yeast. So be patient.

During fermentation, try to maintain a constant temperature and keep fluctuations to a minimum. A variation of as much as 10°F (5.6°C) during primary fermentation, even if the temperature remains within the strain's stated range, can yield off flavors and what some tasters have reported as an oily or slick mouthfeel. Giving the yeast cells enough time to finish their job helps them take care of any off flavors they may have produced during the main fermentation.

On that note, hot-fermented kveik still needs a few days to finish up before you cool it down, whether you cold crash or prefer to allow the temperature to fall naturally. If you ferment hot, keep it hot until fermentation is complete. Fermenting kveik ales at the lower end of their recommended temperature ranges will take a little longer, but a cooler ferment can suppress the phenols and esters that may or may not suit the beer you want to brew.

PERSONAL EXPERIENCE

Speaking of that, in my experimentation, I have found that it's important to carefully consider hops selection when formulating a recipe with kveik. The right hops combined with the right kveik strain can be a delight, but some hops can fall flat when paired with particular strains. Each variety of kveik has a distinctive personality, so take time to read the profiles before making a selection.

Case in point: I used Voss kveik for an IPA that turned out good, but not great. It wasn't a bad beer, just "generic" tasting. None of the hops varieties complemented one other, and my choice of yeast did not lift them up. The yeast performed fantastically (fermentation was fast, only 4 days in primary and a week in secondary), and the beer was very drinkable, but I missed the mark on hops.

In contrast, clean, highly flocculent strains can perform well in many different styles, especially when fermented on the cooler side, which is to say at or slightly above 70°F (21°C). These strains can be used to produce pseudo-lagers, and they clear up admirably. They can also work well when fermented hot, but again, let hot-fermented kveik finish up before slowly bringing the temperature down. That will allow the yeast to stabilize before you cold crash. As stated above, a big temperature change can cause flavors that the yeast won't drive off.

Brew This!

Lutroberfest Ale

Märzen-style ale

Recipe courtesy of Ryan Kriesch.

Don't be rushed on this one. Let it go for 14 days at 70–74˚F (21–23˚C) before racking it. If you want to go warp speed, crank up the primary fermentation temperature to 90˚F (32˚C) and let it do its thing. After primary is done, let it cool naturally to ambient temperature.

Batch volume:	5.5 US gal. (20.8 L)	**Color:**	10 SRM
Original gravity:	1.057 (14˚P)	**Bitterness:**	23 IBU
Final gravity:	1.010 (2.6˚P)	**Alcohol:**	6.2% by volume

MALTS

5.3 lb. (2.38 kg) Briess Pilsen malt
4.8 lb. (2.18 kg) Briess Ashburne Mild malt
1 lb. (454 g) Briess Bonlander Munich malt
8 oz. (227 g) Briess Aromatic malt
8 oz. (227 g) Briess Caramel 60˚L malt

HOPS

0.9 oz. (26 g) German Tradition, 6.1% a.a. @ 60 min
0.67 oz. (19 g) German Select Spalt, 2.6% a.a. @ 5 min

ADDITIONAL ITEMS

½ tablet Whirfloc @ 15 min
1 tsp. (5 mL) Wyeast Yeast Nutrient @ 10 min

YEAST

Omega OYL-071 Lutra

BREWING NOTES

Mash at 152˚F (67˚C) for 60 minutes. Lauter, sparge, and collect wort. Boil 90 minutes, adding hops and other items as indicated. Chill to 70˚F (21˚C) and pitch yeast.

Ferment at 70˚F (21˚C) for 2 weeks. Condition in secondary at least 2 weeks, but 4 weeks would be even better. Just let the yeast do the talking—it'll tell you when it is ready.

Cold crash (optionally with gelatin) and then keg. Allow to carbonate for one week in the keg before enjoying.

If bottle conditioning at ambient temperature and you cannot cold crash, optionally fine with gelatin 5 days before bottling (don't worry there will be plenty of yeast to carbonate). I like using 2.5 vol. (5 g/L) of carbonation. After 2 weeks in the bottle, refrigerate for a minimum of 4 days and enjoy.

EXTRACT VERSION

Steep 2 oz. (57 g) Caravienne malt and 2 oz. (57 g) Caramel 60˚L malt in 1 gal. (3.79 L) of 155˚F (68˚C) water for 30 minutes. Remove grains and completely dissolve 8.6 lb. (3.9 kg) pale liquid malt extract and 3 oz. (85 g) amber dried malt extract in the resulting wort. Top up kettle with water to desired boil volume and proceed as above.

Photo © Getty/tonaquatic

Brew This!

A Kveiking We Will Go

American IPA Recipe courtesy of Ryan Kriesch.

This is a straight-up American IPA that leans towards citrus and tropical fruit notes. It is lighter in color than many IPAs.

Batch volume: 5.5 US gal. (20.8 L)
Original gravity: 1.061 (15˚P)
Final gravity: 1010 (2.6˚P)
Color: 4 SRM
Bitterness: 66 IBU
Alcohol: 6.8% by volume

MALTS

12 lb. (5.4 kg) American two-row malt
12 oz. (340 g) Carapils

HOPS

1 oz. (28 g) Idaho 7, 13% a.a. @ 30 min
1 oz. (28 g) Sabro, 15.5% a.a. @ 15 min
1 oz. (28 g) Mosaic, 12.5% a.a. @ 5 min
1 oz. (28 g) Mosaic, 12.5% a.a., whirlpool
1 oz. (28 g) Sabro, 15.5%, a.a., whirlpool
2 oz. (57 g) Idaho 7, dry hop 2 days

ADDITIONAL ITEMS

½ tablet Whirfloc @ 15 min
1 tsp. (5 mL) Wyeast Yeast Nutrient @ 10 min

YEAST

Imperial A44 Kveiking

BREWING NOTES

Mash at 152˚F (67˚C) for 60 minutes. Lauter, sparge, and collect wort. Boil 90 minutes, adding hops and other items as indicated. Chill to 70˚F (21˚C) and pitch yeast.

Pitch this one on the warm side, high 80's or low 90's Fahrenheit (low to mid 30s Celsius). Break out the carboy heater and get it hooked up to maintain that warm temperature throughout fermentation. It will be done with primary in 3 to 5 days. Let it rest as the temperature naturally falls to ambient. Once it has reached room temperature, rack to secondary to let the yeast finish up, and then dry hop for 2 days and package.

EXTRACT VERSION

Steep 12 oz. (340 g) Carapils malt in 1 gal. (3.79 L) of 155˚F (68˚C) water for 30 minutes. Remove grains and completely dissolve 9.2 lb. (4.17 kg) pale liquid malt extract in the resulting wort. Top up kettle with water to desired boil volume and proceed as above.

When fermenting with "clean" kveik yeasts like Oslo or Lutra at a low temperature, treat them like any other ale yeasts. If you want to go cooler than 70°F (21°C), then be sure to make a yeast starter. If you'd rather crank up the temperature to 11, go for it, but keep a blow-off tube handy. Those hot fermentations can get messy.

HAPPY KVEIKING

Kveik yeasts have a solid following, and we're only starting to learn how to use these strains in everyday brewing. It's a great time in which to have fun and experiment. I hope you enjoy your voyage into the realm of kveik yeasts and have fun exploring these heirloom strains. Happy brewing!

Ryan D. Kriesch has made beer and wine for 11 years and mead for two. He is a passionate cook, brewer, and father with a touch of nerd to balance the natural jock—no board game off limits. He encourages readers to brew what you want and remember that the best beers are brewed from the heart and not for a medal.

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BREWING CLEAN BEERS

With Kveik Yeast

By Ryan Pachmayer

Illustration by Diana Bolton

In 2019, I came across a comment on an online forum from a homebrewer claiming to have made a nearly flawless lager-like beer that went from grain to glass in only five days. While it seemed rather impossible to me, there was an intriguing catch: he was using a yeast called Skare, a kveik yeast.

Kveik is a type of ale yeast used in Norwegian farmhouse breweries. Although many of these strains have been used for hundreds of years, they have only recently been popularized in the broader brewing world thanks to Lars Marius Garshol. Lars has worked hard to research and share details about these yeasts and the Norwegian farmhouse brewers who use them. →

Peculier Ales, Windsor, Colo.

Many traditional farmhouse brewers use kveik to make beers using unique processes that can include cooking mashes in ovens or filtering wort with juniper. However, some yeast labs have identified and isolated several clean-fermenting kveik strains, which brewers are starting to use to make clean, almost lager-like beers.

The advantages of using kveik strains are that they ferment warm (70°F to 100°F, or 21°C to 38°C), they ferment cleanly and incredibly quickly, and they are easy to reharvest and reuse.

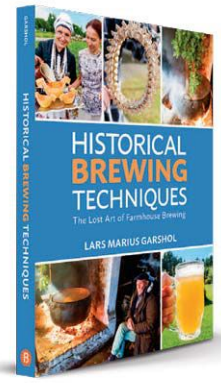
PROS JUMP IN WITH BOTH FEET

When Nick Armitage opened Peculier Ales in Windsor, Colo., in late August 2020, he didn't have time to brew a traditional lager. He had gained experience using Omega yeast during his time as brewer and barrel lead at Weldwerks Brewing in Greeley, Colo., had heard of homebrewers experimenting with Omega's Lutra strain, and thought he'd give it a try. He's been very happy with the results.

Fjords to Valhalla was Peculier's first clean kveik offering, a Pilsner-like beer they call a Scandanavian lager. "While it won't replace our use of lager strains, it allows us to turn around a beer in 14 days," Nick says. He has seen attenuation climb well above 80 percent on second pitches, and he believes that Lutra is so clean and lager-like that it can faithfully replicate even traditional German lagers.

Forty-five miles (72 km) west and 3,000 feet (914 m) above Denver lies Cabin Creek Brewing in Georgetown, Colo. Owner Patrick Toland received the Voss strain from Propagate Lab and brewed a Pilsner-like

Propagate Lab, LLC, Golden, Colo.



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CLEAN KVEIK YEAST GUIDE

Lutra (Omega Yeast):
Isolated from a clean strain of the Hornindal kveik yeast. Very clean strain, but it can deliver a noticeable light lemon note that may mask the underlying flavor of delicate beer styles. A good choice for pseudo-lager beers with some hop flavor, particularly lemon-lime flavors. 75%–82% attenuation. 70°F–90°F (21°C–32°C) fermentation temperature.

KRISPY (Escarpment Labs):
Isolated from the two best-attenuating strains of Skare kveik yeast. Extraordinarily clean. Can suppress palate bitterness, so adjust hop schedule to accommodate. 70%–82% attenuation. 68°F–77°F (20°C–25°C) fermentation temperature range for lager-like beers. Warmer than 78°F (26°C) leads to tropical flavors that are better suited for hoppy beers.

Oslo (Propagate Lab and Bootleg Biology):
Sourced from Eik & Tid brewery in Norway. Very clean. It has a light, lager-like, mineral sulfur. A good choice for classic German styles that showcase noble bitterness and a crisp, dry finish. 76%–86% attenuation. 75°F–98°F (24°C–37°C) fermentation temperature range.

Opshaug (Propagate Lab):
From Strandadalen, Norway, courtesy of Harald Opshaug. Very clean and fast fermenting. Minimal ester production. Good strain for clean, malty beers. 73%-77% attenuation. 60°F–90°F (16°C–32°C) fermentation temperature range, though 85°F–95°F (29°C–35°C) is recommended.

Skare (Escarpment Labs):
Sourced from Gunnar Skare. Escarpment takes three of the cleanest strains from the original Skare culture and isolates them for their version of Skare. Skare is no longer being produced, as KRISPY is considered a better version of the yeast.

Voss (various suppliers):
Very popular for a wide range of beers. Throws off an orange marmalade flavor that is stronger at higher fermentation temperature. Good choice for clean ales, such as blonde ales, with newer hops that can pair well with the yeast character. 73%–77% attenuation. 63°F–101°F (17°C–38°C) fermentation temperature.

Hornindal (various suppliers):
Very popular like Voss. Attenuates well but produces a strong tropical note. Best used in IPA- and IPL-type beers with hops that evoke grapefruit, orange, and guava. 75%–82% attenuation. 75°F–95°F (24°C–35°C) fermentation temperature.

Land & Sea Brewing Co. Blackberry and Fig Kveik Sour, Comox, BC.

Cabin Creek Brewing, Georgetown, Colo.

beer for his brewery's May 2020 opening. "The speed is why we chose it," said Patrick. "We fermented at 100°F [38°C], it had fermented out in about 24 hours, and it was drinkable in eight days, with a hint of orange and no diacetyl."

Over on the West Coast in Anaheim, Calif., Bottle Logic Brewing has made a handful of cleaner beers with kveik yeast. Brewer Chris Birker says they prefer Voss for West Coast–type IPAs and pale ales but that they've been using Lutra for more lager-like beers.

"We first used Lutra in a Pilsner at 90°F [32°C] with pretty good results. It smelled and tasted close to a traditional lager. We then brewed our American light lager with it at 70°F [21°C] and found it to be very close to our original, with a slightly higher sweetness that we prefer over an actual lager strain in this beer. Overall, we really enjoy using these because it allows us to show our customers a new ingredient besides hops, malts, and adjuncts."

Brew This!

Fjords to Vahalla

International pale lager

Recipe courtesy of Nick Armitage, Peculier Ales, Windsor, Colo.

This Scandanavian lager is malty with clean bitterness and a light lime zest aroma from Wai-iti hops.

Batch size: 5.0 US gal. (18.9 L)
Original gravity: 1.044 (11°P)
Final gravity: 1.009 (2.3°P)
Efficiency: 70%
Color: 3 SRM
Bitterness: 18 IBU
Alcohol: 4.6% by volume

MALTS & ADJUNCTS

4.3 lb. (1.95 kg) Weyermann Pilsner Malt
3.0 lb. (1.36 kg) Rahr Pilsner Malt
8.0 oz. (227 g) flaked corn
6.0 oz. (170 g) acid malt
6.0 oz. (170 g) Weyermann Carahell Malt

HOPS

0.3 oz. (7 g) Millennium, 14.2% a.a., FWH
1.4 oz. (40 g) Wai-iti, 3.0% a.a. @ 0 min

YEAST

Omega OYL-071 Lutra Kveik

BREWING NOTES

Mash at 152°F (67°C) for one hour, targeting a mash pH of 5.4 with 30 ppm chloride. Lauter, sparge, and collect wort. Boil 60 minutes, adding hops as indicated.

Chill wort to 90°F (32°C), pitch an active starter package of Omega Lutra yeast, and ferment 4 days. Cool to 75°F (24°C) for one day, then drop to 50°F (10°C) and transfer to new vessel if harvesting yeast off the bottom. Use finings or gelatin if you plan to filter the beer. Drop to 30°F (–1°C) for 5 to 10 days before bottling or kegging.

PARTIAL-MASH VERSION

Omit the acid malt and all but 1 lb. (454 g) of the total Pilsner malt. Mash 1 lb. (454 g) of Pilsner malt with the flaked corn and Carahell malt for 60 minutes at 152°F (67°C). Lauter, sparge, and fully dissolve 5 lb. (2.27 kg) Pilsner liquid malt extract in the resulting wort. Top up with water to desired boil volume, add first wort hops, bring to a boil, and follow the remainder of the recipe as above.

Illustration by Diana Bolton. Photos courtesy of Peculier Ales; Propagate Lab, LLC; Kent Bernadet (Land & Sea Brewing Co.); Cabin Creek Brewing

Brew This!

Hellya Blonde

Belgian blonde ale

Recipe Courtesy of Eli Gerson, Ramblebine Brewery, Grand Junction, Colo.

This kveik blonde ale has a rich malt character of toast, caramel, and biscuit combined with a distinct orange marmalade citrus from the kettle hop additions and the Voss yeast. Ramblebine pitches hot to maximize yeast character.

A delicious variation on this beer uses Mandarina Bavaria in place of Cascade in the whirlpool. If you go that route, use twice as much Mandarina Bavaria as you would Cascade.

Batch size: 5.0 US gal. (18.9 L)
Original gravity: 1.056 (13.8˚P)
Final gravity: 1.013 (3.3˚P)
Efficiency: 70%
Color: 7 SRM
Bitterness: 30 IBU
Alcohol: 5.7% by volume

MALTS & ADJUNCTS

5.2 lb. (2.38 kg) Proximity Pilsner Malt
3.5 lb. (1.59 kg) Proximity Pale Malt
1.7 lb. (765 g) Proximity Munich Malt, 10˚L
7.0 oz. (198 g) Proximity Biscuit Malt
5.0 oz. (142 g) Briess Caramel/Crystal Malt, 10˚L

HOPS

1.3 oz. (37 g) Cascade, 5.5% a.a. @ 60 min
1.3 oz. (37 g) Cascade, 5.5% a.a., whirlpool/steep 10 min

YEAST

Omega OYL-062 Voss Kveik

WATER

Ca 57 ppm, Mg 5 ppm, Na 37 ppm, Cl 75 ppm, SO_4 44 ppm

BREWING NOTES

Pitch an active starter of Voss yeast at 100˚F (38˚C) for three days. Crash to 40˚F (4˚C) for 2 days.

EXTRACT VERSION

Substitute 2.1 lb. (952 g) of pale liquid malt extract for the Proximity Pale Malt and 4 lb. (1.81 kg) Pilsner liquid malt extract for the Proximity Pilsner Malt. Steep the remaining grains in 2.5 gal. (9.5 L) of 152˚F (67˚C) water for 30 minutes. Remove and rinse the grains and heat the pot to boiling. Remove from the heat source and dissolve the extracts. Top up kettle to 6.5 gal. (24.6 L), heat to boil, and add hops as outlined in the recipe.

LAGER CLEAN?

James Spurgeon is an avid homebrewer who lives outside Tyler, Texas. He brewed a clean base batch from his Lake Fork Brewery and split it into four fermenters, using Weihenstephan 34/70 yeast in one fermenter and three different kveik yeasts (KRISPY, Lutra, and Oslo) in the other three fermenters. Fourteen tasters, many from the East Texas Brewers Guild, sampled these beers without knowing the variable and provided extensive notes.

The base beer was 100 percent Ireks Pilsner malt with a combined 8 IBUs of Hallertau Mittelfrüh hops added 60 and 30 minutes before the end of the 90-minute boil. The Weihenstephan 34/70 batch was fermented at 53˚F (12˚C) and slowly warmed after seven days. Lutra and KRISPY were fermented at 72˚F (22˚C), and Oslo was fermented at 76˚F (24˚C). The beers were conditioned for almost a month before they were tasted. The results were interesting.

While five of the tasters preferred the Weihenstephan 34/70 beer, four the KRISPY, three the Oslo, and two the Lutra, their least favorite beers were almost the opposite. Eight disliked the 34/70 batch the most, four disliked KRISPY the most, two Lutra, and none disliked Oslo the most.

When asked what style of beer tasters thought they were drinking, the Lutra had nine guesses of lager or Pilsner, while the other three styles had four or five lager or Pilsner guesses each.

James quizzed blind participants on a variety of other aspects of the beers, from mouthfeel to aroma to guessing the testing variable. For full results of the blind taste test, visit his Instagram page @lakeforkbrewing.

NORTH OF THE BORDER

In Canada, breweries are using Escarpment Laboratories' clean KRISPY strain, the result of cofounder Richard Preiss's having eliminated a lower-flocculating strain from the popular Skare yeast.

"KRISPY does pretty well from 68°F to 77°F [20°F to 25°C]," he says. "I've personally had success plugging it into German helles recipes with great results. It attenuates pretty similarly to the low end of lager yeasts."

Tessa Gabiniewicz, head brewer at Land & Sea Brewing Co. in British Columbia, has made a wide range of beers using KRISPY. She has specifically enjoyed using the yeast in a California Common.

"It's almost too clean to call it a lager," she says. "It really complements the crisp, clean finish and crushability that this yeast provides." Tessa has had great results with dark and dry-hopped lagers as well. Eighteen days is her fastest grain-to-glass time, but she feels confident that she can do it well in as few as 12 days.

Between May and October 2020, Beerlab! in London, Ontario, brewed eight beers with KRISPY. "We utilize a decreased pitch rate to promote a more vigorous fermentation," says founder and brewmaster Adil Ahmad, adding, "KRISPY can generate a bit of sulfur during fermentation, but it is easily purged with CO_2." Adil has also experimented with yeast nutrient and found that Superfood increases performance considerably.

Land & Sea Brewing Co.'s brewhouse, with head brewer Tessa Gabiniewicz.

Land & Sea Brewing Co. Black Diamond Dark Lager, Comox, BC.

HOMEBREWING

But it's not just professionals using kveik yeasts to make clean beers. Bradley Janowski works for Live Oak Brewing in Austin, Texas, and is an active homebrewer. As a pretty strict lager brewer, he prefers to call these clean kveik beers cream ales or blondes. He really likes the Oslo strain, though: "It is jaw-dropping clean and lets the malt shine."

Bradley isn't trying to replace lagers with Oslo; he just wants to see how similar he might get to a lager and take advantage of scheduling gaps. "It's great for additional brews where you don't have the temperature control space when you're brewing often." He added, "It's mind blowing how fast these kveiks taste clean and drinkable, even with higher ABV."

TIPS FOR BREWING CLEAN KVEIK BEERS

Pick a beer style that suits your choice of yeast. Some kveik yeasts throw subtle aromas and flavors that suit some styles better than others. Others are cleaner and more neutral. If you're trying to get close to a traditional style, pay attention to the typical degree of attenuation for that style and choose a kveik yeast that matches.

Start with realistic expectations. While brewing with kveik yeast isn't like starting from scratch, you're fermenting at a higher temperature with a much faster fermentation than you would get from most other yeasts. Trying to perfect a mock German helles on your first attempt is probably not wise. The recipes that accompany this article are accessible to first-time clean-kveik brewers.

Get your equipment ready. Make sure you have a way to reliably ferment at the temperatures these yeast strains prefer—this often means finding a way to ferment warmer than 80°F (27°C). I use a cheap heating pad connected to my temperature controller, but affordable grow mats are also popular. In the warm months, many brewers use their garages.

Pitch heavy. Kveik farmhouse brewers are known for extremely low pitch rates in their beers. The yeast is strong and does its job, while throwing off interesting flavors that are unique to each strain. For clean kveik beers, however, almost every professional brewer and experienced homebrewer with whom I spoke pitches at or near usual ale pitch rates to achieve the cleanest results.

Add nutrients. Most kveik yeasts need a good source of nitrogen to perform well, particularly when fermenting worts with lower original gravities. Find a nutrient blend that includes diammonium phosphate (DAP) and use up to twice the recommended amount.

Pay attention to temperature, time, and attenuation. The general rule of thumb is that the cooler you ferment, the longer fermentation will take. That said, we are talking about two to three days for many of these strains at 90°F (32°C), and up to a week when fermented closer to 70°F (21°C). The lower temperature ranges for many of these yeasts produce the cleanest profiles, but they aren't always ideal, as such fermentations may under-attenuate or stall. Fermentation can stall when the yeast starts warm and is cooled during the ferment. Conversely, I've personally had a lot of success starting lower and raising the temperature slightly to help maximize attenuation.

It can take a while for many of these strains to flocculate. While many homebrewers talk about doing grain to glass in under a week, the professionals are usually doing 10 to 14 days with these yeast strains to produce a clean, clear beer. Consider using gelatin or biofine and cold crashing to get the best results.

Several brewers have told me they like to increase hopping rates when using kveik yeasts, as the finished beer can be noticeably less bitter than planned. I've found this to be the case in my own trials, especially with Lutra. A good starting point is to increase the bittering addition by 10 to 15 percent.

The traditional way to harvest kveik yeast is to pull from either the top or the bottom at a specific time during fermentation, based on when the original farmhouse brewer would have reharvested. This will help you avoid any potential yeast mutations. There is a kveik yeast registry on Lars Garshol's website where you can find this information for most yeast strains.

Brew This!

Skarkey American Pilsner

American lager

Recipe Courtesy of Chris Saunders, Escarpment Labs

This is a slightly modified version of the Gold Country Pilsner recipe found in *Session Beers* by Jennifer Talley. The result is reminiscent of a Bohemian-style lager with more fruity esters. In traditional American lager style, drink this while the mountains are still blue!

Batch size: 5.0 US gal. (18.9 L)
Original gravity: 1.048 (11.9˚P)
Final gravity: 1.010 (2.6˚P)
Efficiency: 70%
Color: 3 SRM
Bitterness: 32 IBU
Alcohol: 5% by volume

MALTS & ADJUNCTS

6.6 lb. (2.99 kg) Rahr Pilsner Malt
1.8 lb. (816 g) flaked rice
1 lb. (454 g) Weyermann White Wheat Malt

HOPS

0.2 oz. (6 g) Columbus/Tomahawk/Zeus, 15.5% a.a. @ 60 min
0.1 oz. (4 g) Columbus/Tomahawk/Zeus, 15.5% a.a. @ 15 min
1.7 oz. (50 g) Saaz, 3.8% a.a. @ 5 min
1.0 oz. (28 g) Cluster, 7.0% a.a. @ 5 min
1.0 oz. (28 g) Saaz, 3.8% a.a., whirlpool/steep 15 min @ 170˚F (77˚C)

YEAST

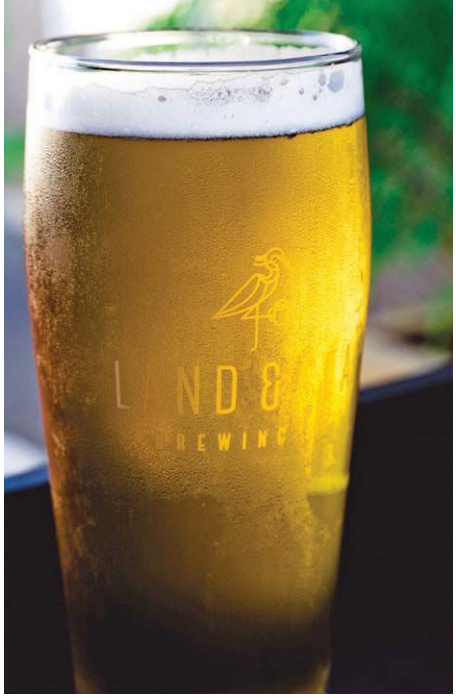
200 billion cells Escarpment KRISPY

WATER

Ca 50 ppm, Mg 7 ppm, Na 5 ppm, SO_4 75 ppm, Cl 60 ppm

BREWING NOTES

Mash at 155˚F (68˚C) for 60 minutes. Mash out at 170˚F (77˚C) for 10 minutes. Boil 60 minutes, adding hops as indicated. Cool to 77˚F (25˚C) and pitch yeast. Ferment until specific gravity stabilizes at or near 1.010 (2.6˚P). Bottle or keg.



Land & Sea Brewing Co. Sea Hoppy Kveik Lager.

A more popular way is to just harvest the yeast after primary fermentation is complete in three to seven days. Scrape off the dead yeast, put the healthy yeast in a clean jar, and use it within a few months. Many breweries are doing it this way. You can also spread the healthier yeast out on a lined baking sheet and dry it out of the sun in a relatively warm, clean place (an unused oven or closet for instance) until you can crack flakes off, about one to four days. Store the dried flakes in a sealed container or bag in the freezer. This is a great way to share kveik yeasts with friends, and there are several kveik trading groups specifically built for sharing. Building up a starter with the dried yeast is a good idea when reusing it.

FUTURE OF CLEAN KVEIK YEASTS

Commercial brewers and homebrewers alike appreciate the short fermentation time, forgiving temperature requirements, ease of use, and ability to reuse that kveik strains offer, and the popularity of clean kveik yeast ferments should continue to grow. It's less a flavor trend (that may or may not enjoy longevity) than it is a process alternative, another tool in the toolbox for brewers to consider.

Matthew Peetz of Propagate Lab in Golden, Colo., received his first kveik strains from Lars several years ago. He keeps all of the strains in their original forms to preserve the flavor and performance characteristics of the original farmhouse breweries they came from. His lab supplies around 200 commercial breweries and recently began selling directly to homebrewers. They've witnessed growing interest from both commercial brewers and homebrewers in making clean kveik beers, and they plan to continue to find ways to meet the demand.

Back in Canada, Richard Preiss at Escarpment Labs tells me he's actively seeking more clean kveik strains, knowing it is something his customers want. He is particularly eager to find higher-attenuating clean strains. (As this article was going to press, Escarpment Labs released a kveik strain named Jordal, which reportedly ferments clean and reached up to 86 percent attenuation during trials.)

Every week, I see more and more homebrewers trying their hands at pseudo-lagers and blonde ales with kveik strains, and many report good results. American breweries have only begun to use these yeasts professionally, but they are encouraged by the early results. It is likely we'll see improvements in recommended best practices throughout 2021 and beyond.

WHERE TO FIND

Several kveik strains are in low production and/or high demand. If you're shopping locally, call ahead to make sure your shop has what you want. For best results, consider shipping liquid yeasts using one- or two-day shipping with an ice pack.

- Bootleg Biology sells direct to customers on their website (bootlegbiology.com) and supplies a small selection of North American retailers.
- Escarpment Labs sells direct to Canadian consumers on their website (escarpmentlabs.com). GA Brew Supply (gabrewsupply.com) ships Escarpment products within the United States.
- Omega Yeast's website (omegayeast.com) features a store locator that shows homebrew shops across the country that carry their strains.

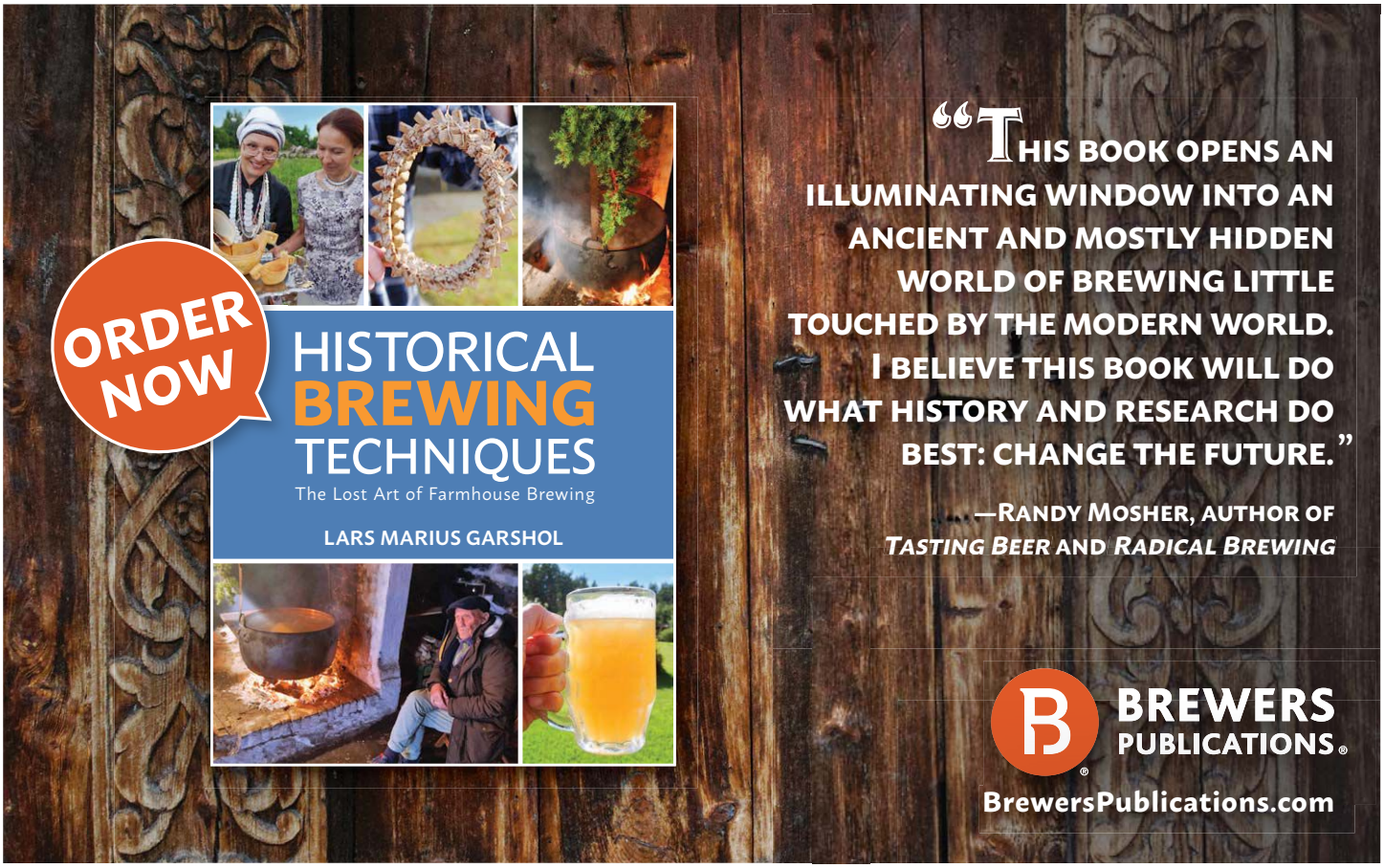
- Propagate Lab supplies most major homebrew shops in Colorado and sells direct to consumers outside the state via its website (propagatelab.com).

Yeast trading groups are also a source for kveik strains. Homebrewing DIY hosts a Discord group with a kveik-trading channel where homebrewers will send out dry harvested yeast to curious brewers and trade with others. There are several Facebook groups for this as well.

FURTHER READING

Lars's blog (garshol.priv.no/blog) is a fantastic resource for all things kveik. His book *Historic Brewing Techniques* is well worth a read as well. The Brewing with Kveik Facebook group has thousands of members from around the world, including several all-kveik breweries in the USA. Many members are brewing clean kveik beers. Escarpment Labs also has a host of informative articles on their website about their experiences using their Skare and KRISPY clean kveik yeasts.

Ryan Pachmayer is a BJCP Certified judge and homebrewer of 14 years. He is a serial entrepreneur and resides in Arvada, Colorado. He can be reached at ryan@puzzah.com.



Fest Test

By Brady Smith

As a weekender local homebrew shop (LHBS) employee of more than a decade, I've witnessed the following scenario many times:

Homebrewer:
"I'd like to make a crowd-pleasing beer for my neighbor's party, but they prefer macro lagers, and I don't have temperature control. Plus, I heard they're finicky and show every flaw." Or, "I'd like to brew for an Oktoberfest-themed competition this fall, but I've heard malty lagers are hard to make and require a longer aging period than my beer fridge capacity allows."

Well-intentioned LHBS employee:
"You'll need temperature control to make an authentic, clean lager, but there are a few yeast hacks that should produce a lager-like beer if you don't have temperature control."

The LHBS employee then presents a variety of possible solutions for producing a passable, traditionally cool-fermented beer at ambient household temperatures. Common suggestions are detailed in the sidebar.

Debates around the use of ale yeasts and hybrid yeasts to brew lager-like beers usually center around a yeast's ability to minimize phenol and ester character in the finished beer. Phenolic flavors are often described as clove-like, smoky, or medicinal, and undesirable phenolic character is commonly caused by chloramine and bromine in brewing water. Yeast-derived phenolic character such as 4-vinyl guaiacol (4-VG) is a desired characteristic of weizens and many Belgian-style ales, but it's generally undesirable in other styles, especially lager beers. Esters are formed during fermentation by the combination of fusel alcohol and fatty acids. Esters produce a variety of fruity and perfume-like aromatics and flavors that lend complexity to most ale styles, but pronounced ester character is generally verboten in traditional lager beers.

BREW DAY

For the past several years, we have brewed 20-gallon (76-liter) batches of festbier in late May at the Great Fermentations homebrew store's warehouse in preparation for upcoming Oktoberfest events. To compare cold- and warm-fermented beers, we divided our 2020 festbier wort among four identical 5-gallon (18.9-liter) fermenters. We compared Imperial Organic L13 Harvest fermented with a traditional lager schedule to three room-temperature fermentations with Fermentis W-34/70 and Omega Yeast Lutra (see Table 1). Lutra was tested in batches with and without a starter to assess the necessity for (and effect of) using a yeast starter, a common question from customers.

→

ALTERNATIVES TO TRADITIONAL LAGER YEASTS AND TECHNIQUES

California common strains:
Hybrid yeasts such as Wyeast 2112, White Labs WLP810, Mangrove Jack's M54, Imperial Organic L05, and Omega OYL-105 have a fermentation temperature range of 58°F to 68°F (14°C to 20°C). They produce more lager-like beers at the lower end of this range with temperature control but are intended to produce the subtle, fruity esters expected of the California common style.

Bohemian lager strains:
Fermentis W-34/70, White Labs WLP830, Wyeast 2124, Omega OYL-106, and Imperial Organic L13: Traditional practice is to pitch these strains into 48°F to 55°F (9°C to 13°C) wort and follow various temperature schedules during primary fermentation, but many warm fermentation experiments have been performed and documented at homebrew and commercial scales in recent years. Refer to the Homebrew Con seminar archives on the AHA website for Fermentis presentations in 2017 and 2019, and to the Warm-Fermented Lager thread on HomebrewTalk.com.

Traditional ale strains:
Chico strains and malt-forward Scottish ale strains, among others, will produce beers with low to moderate detectable esters when pitched into 60°F to 65°F (16°C to 18°C) wort and fermented in a cool area such as a basement or garage.

Kveik strains:
OYL-091 Lutra is a specific strain isolated from Hornindal kveik that produces clean pseudo-lagers over a wide temperature range of 68°F to 95°F (20°C to 35°C). Omega recommends fermentation between 68°F and 72°F (20°C to 22°C).

Bottles of festbier fermented with different yeast strains.

TABLE 1: FERMENTATION PROFILES FOR EACH BATCH OF BEER.

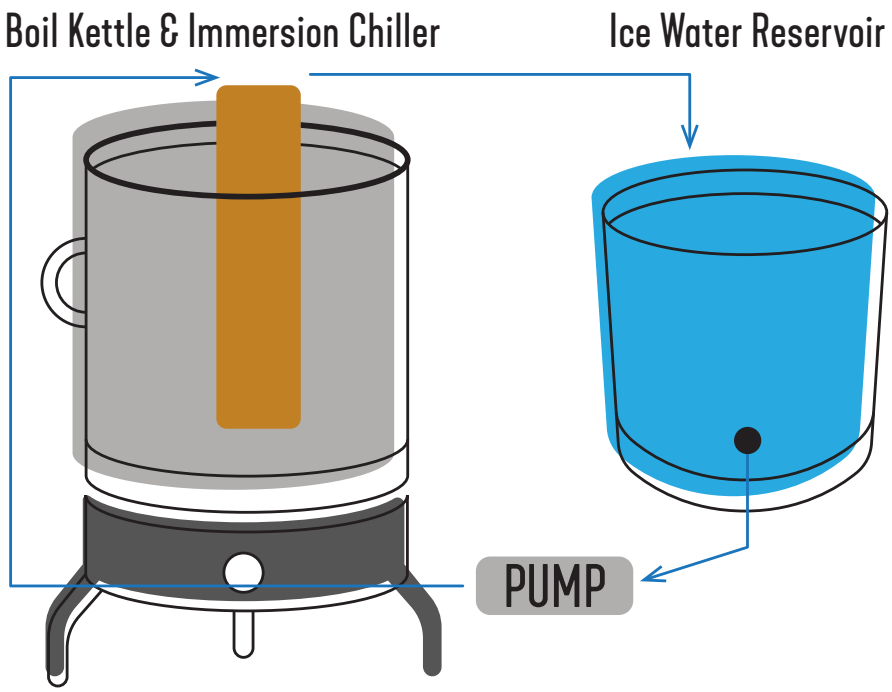
	Beer 1	Beer 2	Beer 3	Beer 4
Yeast	Fermentis W-34/70	Omega OYL-071 Lutra	Imperial Organic L13 Harvest	Omega OYL-071 Lutra
Approx. cell count	300 billion (2 packs, rehydrated)	400 billion (2 L starter)	400 billion (2 L starter)	150 billion (direct pitch)
Pitch temperature	68°F (20°C)	68°F (20°C)	52°F (11°C)	68°F (20°C)
Keezer Setting (Day 1-6)	68°F (20°C)	68°F (20°C)	52°F (11°C)	68°F (20°C)
Core Temp (Day 4)	74°F (23°C)	76°F (24°C)	56°F (13°C)	72°F (22°C)
Keezer Setting (Day 7-12)	68°F (20°C)	68°F (20°C)	60°F (16°C)	68°F (20°C)
Core Temp (Day 9)	70°F (21°C)	72°F (22°C)	62°F (17°C)	72°F (22°C)
Final Gravity	1.010 (2.6°P)	1.012 (3.1°P)	1.012 (3.1°P)	1.012 (3.1°P)

This festbier is a modern, pale, malty "tent beer" with supportive hop bitterness and spicy, floral aromatics from Perle and Mittelfrüh additions, all of which meld beautifully after 10 to 12 weeks of lagering. Splitting large batches into 5-gallon fermenters has allowed for much yeast experimentation over the years. White Labs WLP838, Fermentis W-34/70, Imperial Organic L13, Wyeast 2633 and Wyeast 2308, to name a few, have all performed admirably under traditional cold lager fermentation schedules.

The pandemic delayed our brewing the 2020 batch until mid-July. At the time of brewing, it was unclear whether Oktoberfest events would proceed as normal, but we pulled up our lederhosen and soldiered on.

Immediately before mashing, we heated all the brewing liquor to 80°F (27°C), dosed it with dried malt extract (DME) and active dry yeast, and allowed it to rest for about two hours. This step, referred to as yeast oxygen scavenging (YOS), is a simple way to reduce dissolved oxygen in brewing water, with the end goal of enhancing malt flavor and prolonging shelf life. (For a deep dive down the low-dissolved oxygen rabbit hole—LODO—refer to the LODO thread on HomebrewTalk.com and germanbrewing.net/docs/Brewing-Bavarian-Helles.pdf.)

This festbier is brewed using a two-step, no-sparge mash with a 30-minute decoction boil in between the 144°F (62°C) and 160°F (71°C) rests. The decoction step is particularly useful for efficiently reaching the 160°F (71°C) rest, as direct-firing and stirring a maxed-out mash tun with 43 pounds (19.5 kilograms) of grain and 32 gallons (121 liters) of strike water without spilling or scorching would be a real chore.



During the 160°F (71°C) mash rest, a pump slowly recirculated wort for 20 minutes to set the grain bed. We then pumped wort to the boil kettle and boiled for 90 minutes, with yeast nutrient and Whirlfloc additions 10 minutes before flameout.

Chilling 22 gallons (83.3 liters) of post-boil wort proved a modest challenge with 74°F (23°C) midsummer groundwater. Using a Jaded immersion chiller (generally intended for 5- to 10-gallon batches), we chilled the wort down to 100°F (38°C) in approximately 20 minutes. During this time, we cleaned the mash tun, filled it with water and ice, and repurposed it as a cold-water reservoir to complete the chilling process. Once the wort reached 100°F (38°C) with groundwater, we set up a closed-loop recirculating system (see diagram) in which the cold reservoir fed the immersion chiller via a pump, and the immersion chiller outflow drained back

Photos courtesy of Brady Smith

TABLE 2: OVERALL RESULTS

Perceptual Category	Perceptual Descriptor	Scale	Beer 1 W-34/70 (68°F/20°C)	Beer 2 Lutra, 2L starter (68°F/20°C)	Beer #3 Harvest, 2L starter (52°F/11°C)	Beer 4 Lutra, 1 pack (68°F/20°C)
Aroma	Malt Richness	0 to 5 (Not Perceived to Very Rich)	3.0	2.5	2.4	3.2
	Hops Aromatics	0 to 5 (Not Perceived to Very High)	2.3	2.1	2.6	1.7
	Fermentation Character	0 to 5 (No Yeast Character to High)	1.6	2.4	3.3	2.6
Appearance	Head Retention	0 to 5 (None to Long-Lasting)	3.4	3.2	3.9	2.5
	Clarity	0 to 5 (Cloudy to Filtered Brilliance)	3.2	2.8	3.9	3.5
Flavor	Toasty	0 to 5 (None to Very Toasty)	2.6	2.3	2.4	2.4
	Bread Dough	0 to 5 (None to Very Bready)	1.9	2.1	1.3	1.3
	Sweetness	0 to 5 (None to Very Sweet)	1.9	2.6	2.0	1.7
	Bitterness	0 to 5 (None to Very Bitter)	3.0	2.6	2.3	2.8
	Balance	0 to 5 (Sweet/Malty to Very Bitter)	3.2	2.2	3.0	3.2
	Fermentation Character	0 to 5 (No Yeast Character to High)	2.0	3.0	3.6	3.8
Mouthfeel	Body	0 to 5 (Low to High)	2.5	2.8	2.7	2.8
	Alcohol Warming	0 to 5 (Low to High)	1.8	2.1	1.9	2.3
Overall	Deftly balances strength and drinkability, with a palate impression and finish that encourages drinking	0 to 5 (5 is best)	3.7	3.1	2.6	2.0
	Showcases elegant German malt flavors without becoming too heavy or filling	0 to 5 (5 is best)	3.6	3.0	2.2	2.1
Preference	Favorite	1 to 4 (Most Preferred to Least)	1.2	2.2	3.2	3.4

to the top of the reservoir. Ice water in the reservoir settled at 38°F (3°C).

With our homespun super-cooling rig, 22 gallons (83.3 liters) of wort dropped from 100°F (38°C) to 68°F (20°C) in under 10 minutes. The pump was then turned off while three fermenters (henceforth labeled as beers 1, 2, and 4) were each filled with 5 gallons (18.9 liters) of wort and oxygenated, and yeast was pitched for these room-temperature batches. The remaining 5 gallons of wort bound for the traditional cold-fermented batch (henceforth beer 3) required a few additional minutes to chill from 68°F (20°C) to 52°F (11°C) before being racked, oxygenated, and pitched.

FERMENTATION

All batches were fermented in 7.5-gallon Anvil stainless-steel fermentation buckets placed into one of two temperature-controlled chest freezers, or keezers. Batches 1, 2 and 4 fermented in one keezer at 68°F (20°C), while batch 3 fermented alone in another keezer set at 52°F (11°C). Keezer temperature was confirmed against the thermostat setting using a digital thermometer in a small water bath placed in each keezer. (See Table 1)

After 12 days, each fermenter was transferred into CO_2-purged corny kegs containing a *Speise* solution of 4 oz. (113 g) corn sugar and 4 fl. oz. (118 mL) distilled water to jump start carbonation. Kegs were returned to their respective keezers set at 68°F (20°C) and 55°F (13°C) for one week. On day 20, samples were dispensed to ensure carbonation and to test flavor. The four kegs were then placed into one keezer and gradually chilled to 35°F (2°C) by day 25. On day 35, all kegs were connected to CO_2 set at 10 psi (690 mbar) to encourage uniform carbonation. Finally, on day 44, five samples from each batch were dispensed into 12 oz. (355 mL) glass crown cap bottles with a Blichmann BeerGun, refrigerated, and distributed to a panel of five BJCP judges the following week.

The brewhouse.at Great Fermentations homebrew shop.

JUDGING

Each judge received one 12 oz. (355 mL) bottle from each of the four batches and evaluated them according to BJCP Category 4B Festbier. The panel consisted of two National-level judges and three Master or Grand Master judges. This festbier was put through the gauntlet!

The evaluation form was designed using BJCP perceptual categories of aroma, appearance, flavor, mouthfeel, and overall impression. Each perceptual category included further descriptors scaled from zero to five to quantify specific aspects of the festbier style. Judges also had the opportunity to provide general comments for each beer. After completion, evaluation forms were collected and the results analyzed.

RESULTS

Overall results are shown in Table 2. This was not a competition, but rather an assessment of yeast performance in making a single style of beer under a few isolated conditions. When comparing judge ratings across a single perceptual category, such as hop bitterness, keep in mind that fermentation schedule and yeast strain will greatly affect perception of bitterness between two otherwise identical beers. Therefore, a higher rating in a single perceptual category does not necessarily indicate a better yeast or fermentation schedule, but rather how the chosen ingredients and process influenced the finished product.

Following are judge comments for each of the four beers evaluated.

Beer 1:
W-34/70
Fermented at 68°F (20°C)

Results for fermentation character were particularly interesting. Despite the warm fermentation temperature, judges perceived beer 1 as having the lowest fermentation character (both flavor and aromatic), which is a desirable trait for a lager beer. Beer 1 also received the highest ratings in perceived hop bitterness, malt richness, and toasty character, as well as the highest overall ratings. Beer 1 also finished at 1.010, which was two points lower than the other beers. Its lower final gravity and fermentation character are likely the major drivers in judge perception (and higher scores) in malt and hops character.

TABLE 3: JUDGE COMMENTS FOR W-34/70 FERMENTED AT 68°F (20°C)

Judge	Comments
1	Biscuity. Hint of lemon.
2	Smooth, easy drinking. Favorite hop aroma of the four beers.
3	Crisp, sharp, well balanced, very clean, complex marriage of light toast and bread.
4	Very toasty.
5	Decent example, a bit bitter and thin in finish.

Beer 2:
OYL-071 Lutra (2 L starter)
Fermented at 68°F (20°C)

Judges rated beer 2 as having the second-lowest overall fermentation character, i.e. the second-cleanest beer in the panel. In this experiment, Lutra accentuated malt sweetness, bread-dough character, and body, and it produced a more malt-forward beer compared to the other yeasts. Results suggest that judges preferred a slightly drier, more evenly balanced festbier. Recipe and process adjustments such as decreasing the percentage of Munich malt, increasing bittering hops, and reducing the boil time and volume of the decoction step would potentially improve the balance of this beer under similar fermentation conditions. Lowering pitch temperature to 55°F–60°F (13°C–16°C) (via extended chilling) followed by a free rise to ambient temperature might also reduce fermentation character produced in the early phases of primary fermentation.

Brew This!

Von Steuben Festbier

Batch volume:	20 US gal. (75.7 L)	**Efficiency:**	70%
Original gravity:	1.056 (13.8°P)	**Color:**	10 SRM
Final gravity:	1.012 (3.1°P)	**Bitterness:**	21 IBU
		Alcohol:	5.8% by volume

MALTS

36 lb. (16.3 kg) Weyermann Floor-Malted Bohemian Pilsner malt
4 lb. (1.81 kg) Avangard Munich 6°L malt
3 lb. (1.36 kg) Avangard Munich 15°L malt

HOPS

4 oz. (113 g) Hallertau Mittelfrüh @ 60 min
2 oz. (57 g) Perle @ 30 min

WATER

Ca 60 ppm, Mg 5 ppm, Na 10 ppm, Cl 75 ppm, SO_4 55 ppm, target mash pH 5.3

YEAST

Fermentis Saflager W-34/70 or your preferred alternative (see main article for ideas)

BREWING NOTES

Mash 60 minutes at 144°F (62°C). 30 minutes into the mash, pull and heat a 50% decoction to 160°F (71°C) for five minutes. Heat the decoction to a boil and hold for 20 minutes.

Add the decoction back to the main mash for the next rest at 158°F (70°C), using direct fire as necessary to achieve the temperature change. Mash 30 minutes at 158°F (70°C), after which time recirculate and route wort to kettle after 30 minutes.

Boil 90 minutes, adding hops as indicated. Refer to Table 1 for fermentation schedules, or follow your favorite lager fermentation schedule.

TABLE 4: JUDGE COMMENTS FOR OYL-071 (2L STARTER) FERMENTED AT 68°F (20°C)

Judge	Comments
1	Pear-like ester. Touch of diacetyl. More ale-like.
2	Smooth, easy drinking. Slight alcohol warming.
3	Sweeter than 1, softer and creamy malt finish.
4	A little clovey, fruity, sweeter. Lower bitterness.
5	Fruity and perfume-like which overshadows malt.

Beer 3:
Imperial Organic Harvest
Fermented at 52°F (11°C)

With the 44-day grain-to-glass experiment, beer 3 was at a significant disadvantage. Scores and judge comments indicated high fermentation character and sulfur notes expected in an immature lager. However, it rated highly in hop aromatics, head retention, and clarity. It should be noted that by day 70, beer 3 was cleaner, more balanced, and equally preferred to beers 1 and 2 in several blind tests taken by staff at Great Fermentations.

TABLE 5: JUDGE COMMENTS FOR IMPERIAL ORGANIC HARVEST FERMENTED AT 52°F (11°C)

Judge	Comments
1	Perfume-like hops. Bubblegum ester.
2	Initially was my favorite due to aroma and malt. Light phenol as it warmed.
3	Moderate sulfur notes that mostly off-gassed after several minutes.
4	Sharp and thin with a little sulfur.
5	Green apple, melon, and ethanol in finish.

Beer 4:
OYL-071 Lutra (Single Pack)
Fermented at 68°F (20°C)

Results for beer 4 clearly indicate yeast stress and the need for a higher yeast cell count with this beer and fermentation schedule. It is interesting to note this batch had a lower core temperature during fermentation than beer 2, likely indicating a less vigorous fermentation. Beer 4 was the only one in this test that did not improve with extended aging. Even at day 70, it was consistently the least preferred sample in several informal blind tastings.

TABLE 6: JUDGE COMMENTS FOR OYL-071 (SINGLE PACK) FERMENTED AT 68°F (20°C)

Judge	Comments
1	Subdued malt and hop character. Pronounced esters. Ale-like.
2	As it warms, I get esters and acetaldehyde. Flawed in my opinion.
3	Moderate acetaldehyde in flavor, low wine-like character. Estery.
4	Toasty. Sharp. Rough fermentation taste.
5	Grainy, melon, ethanol.

CONCLUSIONS & LESSONS LEARNED

Fermentations using traditional lager yeasts and cool fermentation temperatures should not be rushed. While it is just a single example, the difference in judge feedback on beer 3 received around day 44 to sampler feedback after day 70 clearly indicates the benefits of patiently lagering a festbier.

All beers, especially beers 1, 2, and 3, benefited from cold conditioning in the keg past the 45-day mark. If a quick turnaround (45 days or less) festbier is needed, both W-34/70 and Lutra produce excellent results.

Results from beers 2 and 4 demonstrate the benefits of increasing yeast cell count, either from pitching two packs of yeast or from using a yeast starter.

Ambient temperature does not equal core (i.e. fermentation) temperature, even at the homebrew scale.

Great Fermentations would like to thank our esteemed panel of BJCP judges—Gordon Strong, Sandy Cockerham, Ron Smith, Andrew Korty, and John Allison—for their time and thoughtful feedback.

Brady Smith is a self-professed lagerhead and a BJCP Certified judge. A recent Jacksonville, Fla., transplant by way of Indiana and Colorado, you're now likely to find him sweating over a kettle or sipping homemade pale, fizzy lagers in the Southern sunshine.

Author Brady Smith winning silver for his light lager at the 2017 National Homebrew Competition in Minneapolis.

There are two key BJCP barleywine styles:

- English 17D
- American 22C

An Experiment with Barleywine

By Chris Pinnock and Phill Turner

Barleywine is a strong ale with alcohol by volume as high as 12% and original gravity as high as 1.120 (28.1°P). Historically, beers most like modern barleywine would have been taken from the first mash runnings, after which the brewer would have reused the mash to obtain a variety of successively weaker beers. In the mid to late 18th century, barleywines were found in the breweries attached to the manors and houses of the upper classes in England.[1] These beers were aged in oak and consumed instead of wine when the wine supply was restricted due to war with Continental Europe. Given the strength and the aging, it is likely that the beer had a wine-like character.

The first commercial example of barleywine was Bass No. 1, marketed in the late 1800s.[2] Its gravity was 1.100 (23.8°P). Production of Bass No. 1 continued until 1995, with a break between 1944 and 1955 due to wartime rationing.[3] There are many other commercial examples. Tennant started to produce a golden barleywine →

in the 1950s, and Adnams Tally-Ho and Fuller's Golden Pride can be found easily in shops and pubs. In the 1970s, recipes for Christmas Pudding would have included barleywine as an ingredient, such as in Delia Smith's recipe.[4] There is a reason that Bass ceased production—demand for the drink has decreased in Britain, and one is less likely to find such beers in British public houses these days.

There are two key BJCP barleywine styles: English 17D and American 22C.[2] The English style should really be called British in the sense that the style has been brewed across the British Isles.

The American style, with its higher IBU, is bitterer and has a stronger hop aroma than the English version. To get the benefits of the American barleywine hop aroma, it should be enjoyed relatively fresh. English barleywines are often aged and will keep for a long time in the right environment. We have seen barleywines more than eight years old win competitions.

Brewing barleywine poses some additional challenges over a regular ale, and brewing a good barleywine is a sign of a skilled homebrewer. First, the mash tun needs to be large enough to hold the hefty amount of grain (rather, the brewer must organize the grain bill and mash thickness to balance extraction with having the ingredients fit). Typically, this means that the beer is made in smaller batches than the standard 23 liters or 5 gallons. This isn't such a bad thing, as barleywine is not something that can be enjoyed in bulk. Second, the beer's long conditioning requirements mean the hop content needs to be considered because bitterness will decay over time.

Finally, packaging will challenge the yeast, particularly if the original gravity is higher than 1.100 (23.8°P) because a large amount of alcohol will persuade the yeast that it's time to give up before carbonation has taken place. Packaging barleywine with fresh, active, multiplying yeast usually yields healthy carbonation.

In this article, we describe an experiment with barleywine and yeast that we conceived near the end of 2018. Both of us brew English barleywines for consumption and for competitions. We usually brew barleywine with a Scottish Ale yeast such as Wyeast 1728. This strain acts slowly, but it yields a good result that is dry yet accentuates the malt. The choice of yeast is a consequence of some experiments by our beer circle, the County Beermakers. In this experiment, we wanted to try other yeasts for comparison to see if we could produce something better or different.

The experiment pitted several popular yeasts against one another.

Before we move on to the details, we should touch on our rationale for doing it in the first place.

If we were to go back 20 or 30 years, we'd see that homebrewers had fewer choices of malts, hops, and yeasts. Many homebrewers use dry yeasts such as Nottingham or S-04 to brew barleywine. Some brewers add wine yeast to reach higher alcohol levels. The County Beermakers recipe for their 1981 Essex Barleywine specifies both beer and wine yeasts.[5] As more yeasts became available on the market, several homebrewers (including those at County) began to experiment with strains such as the Scottish Ale yeast. It would produce strong beers without the need for wine yeast, and the resulting ale would be more beer-like. More recently, there are many more yeasts available, and yeasts such as Thomas Hardy (White Labs WLP099) are becoming popular, too.

This experiment serves to not just validate Scottish Ale yeast as an excellent choice for barleywine, but to compare it against some yeasts that should, in theory, be able to produce a similar beer. The yeasts we have chosen are familiar to us in that we have brewed other beers successfully with them, but there are many other suitable strains appearing on the market.

THE EXPERIMENT

We designed our experiment using a standard barleywine recipe of mostly pale malt with a small amount of crystal malt for

Freshly pitched yeast: you can see it working below the froth in each demijohn.

Photos © Getty/zmurciuk_k (barleywine); © Getty/Tom Meaker (English countryside); courtesy of Chris Pinnock

TABLE 1: YEASTS USED IN THE BARLEYWINE EXPERIMENT.

Key for this article	Yeast	Rationale
Scottish	Wyeast 1728 Scottish Ale	This yeast is often used for English barleywine and serves as that of the control beer. The strain was originally from McEwans in Scotland and eventually found itself in the Duvel brewery in Belgium.[6] The yeast will work through the wort to get the desired alcohol level.[7]
Nottingham	Lallemand Nottingham	A common, readily available, general-purpose English ale yeast used by homebrewers. A relatively neutral ale strain that is stress-tolerant and can be used in higher-gravity ales. This dried yeast has been traditionally used by homebrewers to make barleywine, sometimes helped by wine yeast. One of the authors can detect Nottingham in the final brew.[8]
Saison	Wyeast 3711 French Saison	A versatile high-gravity strain for saison beers and Belgian-style beers with high esters. It leaves a silky mouthfeel and is highly attenuative. It can be used for high gravities or to restart stuck fermentations. One of the authors regularly uses this for saison, and we wondered if it would produce a dry, alcoholic beer.[9]
Trappist	Wyeast 3787 Belgian High Gravity (formerly Trappist High Gravity)	Both of us are fans of Westmalle Tripel, which uses this yeast strain. It's also used for Dubbel-style Belgian beers. We wanted to see how this yeast would perform in a standard barleywine wort, perhaps producing a barleywine with Belgian character. The yeast should be more than capable of coping with the gravity, and we expected it to reach a high ABV.[10]
Thomas Hardy	White Labs WLP099 Super High Gravity Ale Yeast	This strong ale yeast originating from the Thomas Hardy brewery[6] can handle high-gravity fermentations and was an obvious choice for the experiment. Provided the wort is not overwhelmed with sugar content in one go and the brewer feeds the brew with sugar at intervals during fermentation, this yeast can produce a beer of 25% ABV.[11]
London	Wyeast 1028 London Ale	This was lurking in our supplies from a previous brew, so we decided to use it on any surplus wort. This ale yeast is recommended for porters, stouts, brown ales, and dark milds. It will ferment up to 11% ABV.[12]

color. Our brewing circle's barleywine recipe has some wheat in it for head retention,[5] but we decided this was of negligible value given the expected shelf time of the beer.

We split the wort into small batches and fermented it with the yeasts shown in Table 1. All of these yeasts can handle high gravities in some way. Henceforth, we will refer to the yeasts and the beers fermented with them using the key in Table 1.

All of the yeasts were liquid except for the Nottingham yeast. We used one smack pack or vial and did not make a starter for any of them. The smack packs are sufficient for the volumes of wort we produced (about 4 liters, or 4.2 quarts, in each sample).

We brewed the beer on February 23, 2019. The water rested overnight with a Campden tablet added to eradicate chlorine. We treated the water to match the ale profile using a report from Murphy's and Son Ltd.[13] This included adding AMS (a blend of food-grade acids) to the water during heating and DWB (dry water Burtonization) to the mash tun.

This was our first time using this particular mash tun, which had been passed around our beer circle. It's a large, welded, stainless-steel tun, and it kept the heat very well. In fact, the spent grain was still warm the next day. But we hit a snag because the false bottom and filter reduced the capacity by more than we expected—the tun was full to the brim. Our original formulation used 35 liters (9.2 gal.) of water, but we had to reduce to 30 liters (7.9 gal.) due to the tun capacity.

We sparged by hand, gently jugging hot water of approximately 75–80°C (167–176°C) over the grain bed, and then boiled the resulting wort for 90 minutes. We added 300 g (10.6 oz.) East Kent Goldings at the start of the boil. This may seem like a lot of hops, but remember we intended to age the barleywine before drinking it, and the hop character will diminish over time.

BARLEYWINE EXPERIMENT TIMELINE

Feb. 23, 2019	Brew day. Fermentation starts at 18°C (64°F).
Feb. 24–25, 2019	Various airlock replacements.
Apr. 8, 2019	Out-of-the-fermenter tasting and bottling. Bottles put into the fermentation fridge at 18°C (64°F).
Aug. 10, 2019	Bottles moved to a conditioning refrigerator at 12°C (54°F).
Mar. 15, 2020	Tasting with BJCP and Guild judges.
Oct. 3, 2020	Final tasting.

We added Protofloc (Whirlfloc) in the last 15 minutes to clean up the proteins and help with clarification.

After cooling the wort, we split the full volume into five batches of 4 liters (4.2 quarts) each among 5-liter demijohns, and the remaining wort (about 6 liters, or 1.6 gallons) was put into a 13-liter (3.4-gallon) demijohn. We aerated each batch by carefully swirling and shaking the containers. We added the yeasts directly from the packets. The London Ale yeast was added to the large demijohn. The original gravity was approximately 1.100 (23.8°P), a good starting gravity for barleywine.

Once we'd fitted the airlocks, the demijohns were put into a fermentation fridge, where they started fermentation at 18°C (64°F). The London Ale batch remained at room temperature.

By the following day, all the beers were fermenting, although the Thomas Hardy batch appeared to lag a bit. The airlocks had to be replaced on the small demijohns several times due to excessive ooze from the extremely active fermentations, despite the head space. The escaping carbon dioxide pushed the frothy fermentation head up through the airlock. The Nottingham batch seemed to be the most active.

The only observation at this point was that we used too much of the Nottingham dry yeast given the size of the batch, and if we were doing the experiment again, we would have reduced the pitch rate.

Barleywine fermenting with Wyeast 1728 Scottish Ale yeast.

Bottles of barleywine ready for conditioning.

PACKAGING AND TASTING

It's always a good idea to see what your beer tastes like out of the fermenter, if only to tell if it has gone off and save time packaging something that isn't viable. On April 8, 2019, about six weeks after brew day, we bottled the beer and tasted it. We also measured the gravities.

Earlier in the day, we activated a fresh pack of Scottish Ale yeast. We added 2 mL of yeast and a carbonation sugar drop for each 250 mL of beer in the bottle. Our tasting notes for the green beer are given in Table 2. Please bear in mind that this was a young barleywine straight out of the fermenter with little conditioning.

Notice the gravities and ABVs in Table 2: we expected the Thomas Hardy yeast to eat through the wort and be the strongest, but it wasn't to be. The Scottish Ale yeast did exactly what it was supposed to and took the wort to a respectable 10.5% ABV.

The Trappist yeast, to our surprise, exhibited low attenuation, and we assumed this is because the yeast has adapted to high-sucrose worts that include candi sugar. From the gravity readings, it seemed that the Nottingham yeast had eaten anything sweet it could find and, as we suspected, we had probably overpitched the yeast. This beer was our least favorite, and the Thomas Hardy yeast was a front runner. At the time, we were disappointed with the flavor of the Scottish Ale yeast beer, but it was very early days for a barleywine.

The bottles were put into the fermentation fridge at 18°C (64°F) and were eventually moved to a conditioning fridge on August 10, 2019, where they rested at 12°C (54°F).

TASTING WITH THE JUDGES

More than one year from brew day, in March 2020, we managed to hold a meeting of the County Beermakers the weekend before the COVID-19 lockdown started in the UK. In that session, we tasted all of the barleywines. There are two organizations of beer judges: the US-based Beer Judge Certification Program (BJCP) and the UK-based National Guild of Wine and Beer Judges. There were two BJCP judges and four Guild judges at the table. Both the Guild and the BJCP have similar definitions of what an English barleywine should be.

From the BJCP guide (2):

> **17D. English Barleywine**, O.G. 1.080–1.120, 8–12% ABV, 35–70 IBU.
>
> A showcase of malty richness and complex, intense flavors. Chewy and rich in body, with warming alcohol and a pleasant fruity or hoppy interest. When aged, it can take on port-like flavors. A wintertime sipper.

From the National Guild website (14):

> **Barleywine**, O.G. 1.090+, 9% ABV or greater.

TABLE 2: TASTING NOTES ON BOTTLING DAY.

Key for this article	Specific Gravity	Estimated ABV	Tasting Notes
Scottish	1.020	10.5%	Out of all the beers, this was the mildest and cleanest, with a light malt profile.
Nottingham	1.010	11.8%	Harsh nose, definite yeast bite. We didn't like this.
Saison	1.032	8.9%	Phenols are intense, spicy
Trappist	1.040	8.1%	Slightly fruity, approaching a Westmalle Tripel style. Spicy.
Thomas Hardy	1.034	8.7%	Very fruity, plummy, lots of stone fruit.
London	1.034	8.7%	Dark malty flavor, woody as per yeast character

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Left to right: Nottingham, Scottish, Thomas Hardy, Trappist, Saison, London.

Bouquet should be rich, fruity, hoppy, alcoholic, and vinous. The flavor should be full and malty, with a smooth and mature blend of sweetness, hop, and alcohol.

The testing was blind in the sense that the judges didn't know which yeast was used in which beer. They were simply told it was a barleywine. We asked each judge to write a feedback sheet, and we collected metrics based on aroma, flavor, balance, and finish. At the end of the tasting, each judge ranked the beers in order of preference. Here are the consolidated comments in the order in which we tasted the beers.

Nottingham
Opinions were very much divided on this beer. As it is the first beer we tasted, it is sometimes difficult to put it in its place, so we revisited comments after the initial tasting. It came out of the bottle fairly flat and headless but with good color and clarity. There was some positive interest due to the alcohol levels, but three judges found it harsh, too thin in body, and with hot solvents in the taste. Interestingly, three judges felt it met the barleywine style, for which we have noted, this yeast is used. As the tasting progressed, its rank fell. The harshness put everyone off.

Scottish
Out of the bottle, the beer looked a little flat but had good color. The condition was minimal. One judge commented that it was clearer than the Nottingham beer. Generally, judges commented that the beer had a good malt and hop balance, a pleasant malty aroma, and the alcohol levels and complexity were where they should be. The negative comments were about the low condition; however, almost all of the judges said it met the barleywine style.

Thomas Hardy
We were judging this in a pub and, fortunately, we had taken precautions against bottling accidents: the beer fobbed when it was opened. It had a very high condition, and the observant reader will know why. The Thomas Hardy yeast is able to keep going, and for control reasons, we also added the 1728 Scottish Ale yeast to the bottles. This resulted in plenty of head and conditioning, but probably too much.

There was also a slight haze. The fruity esters came through, and two judges noted these. Three judges detected a slight harshness on the finish, but one liked the farewell. One judge particularly liked the way the malt fruitiness and esters married together.

Trappist
The beer came out very clear, with good head and condition. The comments were generally good except for two—low malt and alcohol from one judge and harsh burnt plastic phenols from another one. The judge with the plastic comment put this beer last in his ranking. One felt the balance was not right. One adored it and commented, "Malty and sweet, well balanced—easy drinking." There were a few comments about the finish being slightly unpleasant. Three of the judges said this was a good choice of yeast for a barleywine.

Saison
This one proved to be more difficult. It had a good head and condition, and some complex esters to make it interesting. One judge detected lingering solvent flavors. Silky and vinous were other words used to describe it. One judge wrote, "Not for me!" There was a sharp finish to the beer. One of the authors detected a bubble gum flavor, which is to be expected from the yeast.

London Ale
The judges detected oxidation and an unbalanced flavor. The nose was off. It had good color and condition, but as we expected with this afterthought, it was not a good beer.

Our rankings are detailed in Table 3.

TABLE 3: RANKING OF YEAST SELECTIONS FOR BARLEYWINE.

Position	Yeast	ABV	Notes
1	Scottish	10.5%	Although this had little condition, it ended up coming top overall because it was the beer most true to style. One judge preferred Saison and another preferred Thomas Hardy.
2	Thomas Hardy	8.7%	A very close contender statistically to the first, but fruitier.
3	Saison	8.93%	Favored by one judge only, this dropped to the middle ground overall.
4	Trappist	8.14%	A very similar situation to the Saison.
5	London	8.7%	Oxidized and not a contender, matched the Nottingham in scoring.
5	Nottingham	11.8%	The harshness pushed the beer to the bottom of the list. If it hadn't been overpitched and then helped by a wine yeast, it may well have done better.

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Left to right: Trappist, London, Saison, Thomas Hardy, Scottish, Nottingham.

A FINAL INFORMAL TASTING

To summarize and validate our conclusions, the authors met in October to taste the beers once more. At this point, the beers had been in a conditioning fridge at 12°C (54°F) for almost 14 months. Here are our notes in order of tasting:

Nottingham

The Nottingham beer had no head but some condition. One of the authors detected the Nottingham twang that he uses to identify the yeast on tastings. There was a licorice flavor with an almost burnt aroma of matches. The beer was too alcoholic and hot, with a slight harshness on the palate. Despite it being far more drinkable than it was in March, the harshness meant that it still would not be a contender.

Scottish Ale

The Scottish beer had a bit of initial head and good condition. It had a nutty, malty flavor with the right level of alcoholic warmth and sweetness for the style. There was a slight woodiness, but we believe this to be a well-balanced barleywine. The authors usually brew barleywine with Scottish Ale yeast, and it was pleasing to taste this beer to see how it had developed over time. Shortly after the beer had been brewed, we were not sure whether this batch had worked or not, but any defects had been lost in the conditioning.

Thomas Hardy

The Thomas Hardy beer had lots of condition. As expected, the bottle fobbed (as pictured) and sat quietly overflowing in a dish whilst we tasted the beer. It was not very clear. There was a stone fruitiness to the flavor and an almost caramel sweetness with the heat. There was a lot of alcoholic heat, more than in the Scottish variety, with some fruity esters in play. One of the authors felt that fermenting colder would have benefited this beer to avoid the esters. The harshness on the finish detected in the March tasting had gone.

Saison

The Saison beer had plenty of condition and head. It had a much different spicy aroma to the other beers. There was a touch of bubblegum and some complex phenols. This beer has also improved since our March tasting session. It's spicy, slightly hot with a sweet finish. There's a slight harshness, and, unfortunately, it doesn't fit the profile of an English barleywine.

London Ale

The London beer had plenty of condition and head, but we detected oxidation. The beer looked very clear and good, but it had an unpleasant bitter aftertaste. It was an afterthought when we brewed it, and we have ruled it out as a contender.

Trappist

The Trappist beer was beautifully clear and bright with plenty of condition and head. There was also the running bead on the glass. There was a hint of prune on the nose with some sweetness, heat, and fizz from the conditioning. This was a good beer, but there may have been a hint of oxidation.

Once we ruled out the Nottingham and London strains, we did a final taste comparison of the top four. Our final summary is given in Table 4.

TABLE 4: FINAL COMPARISON OF YEAST SELECTIONS.

Position	Yeast	ABV	Notes
1	Scottish	10.5%	By far our favorite, this is everything an English barleywine should be. It's clean, fits the profile, has complexity, and is not too sweet due to the attenuation.
2	Thomas Hardy	8.7%	A very close second. It's a lot sweeter than the Scottish variant, with stone fruit, hints of caramel, and higher alcohols. There may be judges and brewers who prefer this one to the Scottish.
3	Trappist	8.14%	Very sweet and fruity, but one-dimensional. The yeast is perhaps more suitable for the candi sugars typically used with it.
4	Saison	8.93%	This was spicy, sweet, and hot. A slight harshness knocks it down, unfortunately, and it doesn't fit the profile of an English barleywine.
5	Nottingham	11.8%	Slightly unpleasant, the harshness was not good. Perhaps potentially because we overpitched the yeast.
6	London	8.7%	Oxidized, harsh, wasn't treated as a contender.

CONCLUSIONS

When we started this experiment, we had no idea what the final results would be. Our expectation was that the yeasts would work their magic on the wort and fully attenuate their way through the sugars. Our suspicions were that the Trappist and the Saison yeast would make good beers but potentially be out of the style.

Brew This!

County Barleywine

English barleywine

Our base recipe is based on one by the County Beermakers (countybeermakers.org.uk), a UK beer club based in London and Essex. For the purposes of the experiment, we brewed a larger batch size and used six different yeasts. This is the reference recipe.

Batch volume: 15 L (4 US gal.)
Original gravity: 1.100 (24˚P)
Final gravity: 1.020 (5˚P)
Efficiency: 53%
Color: 10 SRM (20 EBC)
Bitterness: 100+ (calculated)
Alcohol: 10.5% by volume

MALTS & ADJUNCTS

9 kg (19.8 lb.) pale malt
130 g (4.6 oz.) crystal low color malt
130 g (4.6 oz.) wheat malt

HOPS

200 g (7 oz.) East Kent Goldings, 5.15% a.a. @ 90 min

WATER

Treat the water for pale ales.

YEAST

Wyeast 1728 Scottish Ale or White Labs WLP028 Edinburgh Ale

ADDITIONAL ITEMS

1 tablet Protofloc (Whirlfloc) @ 15 min

BREWING NOTES

Wheat malt is included to help with head retention, but it can be left out—the longevity of the beer means this is less important. Mash low at 64˚C (147˚F) to get more fermentable sugars.

We boil for two hours to encourage caramelization, adding the hops 90 minutes before the end. A Protofloc (Whirlfloc) tablet can be added at 15 minutes before knockout to help with clarity.

Even for small volumes, we recommend making a starter and pitching when the yeast is healthy and multiplying. Aerate the wort as much as possible before pitching. Start the fermentation at 18˚C (64˚F). When the beer has finished, it will benefit from bulk conditioning for at least a month.

When packaging, the addition of fresh yeast will help with the carbonation. If using a Wyeast smack pack, activate the yeast several hours before the bottling session, wait for the packet to swell, and use the yeast as freshly as possible (2 mL per bottle). Keep the bottles warm for at least a month to give the yeast help before moving them to a suitable conditioning environment at 12˚C (54˚F).

The Scottish Ale yeast did what it should and produced a stock English barleywine with the right malt profiles, residual sweetness, and warmth. It was our favorite, and it came out on top in the March judges' tasting. This was not our favorite straight out of the fermenter, but it matured to the pole position. The yeast works very well to produce a high-alcohol beer. Sometimes it needs a bit of fresh yeast to help carbonation, but other than that, it is suitable for the style.

The Thomas Hardy yeast produced a fruitier yet weaker beer. For us, it was second place, but a very close second. As with any judging, there is a certain amount of personal preference. If you prefer a fruitier barleywine, the Thomas Hardy yeast may well be for you. Out of the fermenter, this was our favorite. One of the members of our beer circle uses the yeast and the experiment has renewed his interest in using it for making barleywine. Given the active bottles, the addition of bottling yeast is unlikely to be required, and the final beer is likely to be stronger than 8.7%.

The Nottingham yeast left very little behind and produced a very harsh beer. From our initial tastings and observations, we did not expect this beer to be the best and, actually, it turned out to be one of the worst overall. The other beers were fermented with liquid yeast and probably the right amount for the batch size. It's entirely possible that the amount of dried yeast we used (suitable for a 25-liter batch) was too aggressive for our beer. Many homebrewers make good barleywines with the Nottingham strain (sometimes assisted by a wine yeast), and if we were doing this experiment again, we would pitch less.

The London beer was an afterthought to use up some leftover wort. It was not treated the same as the other beers and, unfortunately, it was one of the worst. In hindsight, perhaps the yeast would have performed better had we pitched more of it. It should be capable of producing an 11% ABV beer.

The Trappist and Saison yeasts both produced drinkable strong beers, but we felt that they were out of style. It was surprising that neither fermented the wort well and they left an excessive residual sweetness. The Saison was definitely out of style, and the Trappist was a little one dimensional. We suspect that the Trappist yeast is more suitable at working on the candi sugars used in the Belgian styles. These beers swapped places between the March judges' tasting and the informal tasting. As a result, they share a joint third.

Position	Yeast	FG	ABV
1	Scottish	1.020	10.5%
2	Thomas Hardy	1.034	8.7%
3	Trappist	1.040	8.1%
3	Saison	1.032	8.9%
5	Nottingham	1.010	11.8%
5	London	1.034	8.7%

All the yeasts produced the flavors described by the manufacturers for their respective styles except for the Nottingham yeast. Our conclusion is that the Scottish Ale yeast (Wyeast 1728) is the best yeast in this English barleywine experiment. The Thomas Hardy yeast is a close contender that would have won had we preferred a fruitier ale. It will be interesting to see if in a year's time the Thomas Hardy beer overtakes the Scottish beer. Removing the

London and Nottingham beers from the table, the other yeasts produced the flavors that we expected from them.

GOING FORWARD

The journey does not end here. The barleywines are likely to last a long time, and we are storing them in a conditioning fridge for the foreseeable future.

As we noted in the introduction, we restricted ourselves to strains of yeast that we had experience with. The modern homebrewer is spoiled for choice, and there are many new manufacturers and yeast strains appearing on the market. If we were doing this experiment again, we would focus on "British" yeasts to see what flavors and fermentation characteristics are produced. That said, we will be sticking to the Scottish Ale strain for barleywine, potentially straying over to the Thomas Hardy strain if we want to produce a fruitier beverage.

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Chris Pinnock is an IT consultant and trainer who has been brewing beer at home for five years. He has won various awards at competitions and is interested in the science behind brewing. When he is brewing, you will find him with a thermometer, hydrometer, and pH strips, measuring everything.

Phill Turner is a veteran homebrewer who has won many awards for his beer. He won Master Brewer at the National Association of Wine and Beermakers four times, of which three were in consecutive years. He also won the London Amateur Brewers Hayesenbrau Award three years consecutively. He is both an NGWBJ judge and a BJCP judge.

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Wood You Like Some Apples?

By Scott Kurtz

We may be closer to the end of winter than we are to its beginning, but there's still plenty of time to enjoy fleeting cold-weather favorites—chili cook-offs, bonfires lit with massive hunks of oak and pine, pumpkin-spice everything, and, of course, cider.

Several macro cider options are available commercially, but they often start to taste the same after a while. Some of us live near small cideries that turn out interesting artisanal products, but craft cider hasn't enjoyed quite the same boom that craft brewing has. Fortunately, we homebrewers can play around with cider on a small scale and try out some truly creative ideas. There's nothing more fitting to share by a fire pit on a cold night than a cider that has been aged on the same type of wood that's responsible for warming you and your friends.

The BJCP's cider guidelines offer 11 subcategories—including pear ciders or, more commonly, perry—and a wide variety of possible ingredients. The University of Illinois recognizes 2,500 varieties of apples in the United States alone, with 100 varieties grown on a commercial scale. Throw in all the different varieties of fruits and spices available, and a cidermaker faces endless possibilities.

→

But what about wood aging? Brewers have stored beer in wooden casks and barrels for centuries, and even with today's stainless-steel kegs, barrels and foeders add a depth of flavor that kegs just can't replicate. Vintners have aged wine in barrels for ages, and bourbon just isn't bourbon without having sat on alligator-charred oak for a number of years.

It's only natural that we consider oak for adding tannins and vanillins to our homemade ciders. But is there a better choice of wood, or is oak really the standard for a reason?

GETTING CRAFTY

To search for answers, I approached Kerry Rozanski, head brewer and cidermaker at Crafty Chameleon in Ellisville, Mo.

"I've been brewing for 11 years now, but I first started fermenting ciders after going on a camping trip with a homebrew buddy," says Kerry. "He brought along a keg of 8% [ABV] cider. After sitting by the fire and having a couple pours, I realized it's pretty sneaky and thought it was a pretty cool idea to mess around with."

From that point on, Rozanski played with different cider recipes alongside his beers, showcasing them at local homebrew festivals and seeing how the public responded. He eventually landed the head brewer position at Crafty Chameleon. Originally a craft beer bar, the owners recently expanded and built a small nanobrewery to create their own brand with Rozanski's help. It was at this point that he started to notice how varied the public's tastes and wants were.

"My personal favorite on ciders is semi-sweet. The dry ciders are not really my thing, but I'm not a wine drinker either," Kerry notes. "Dry ciders are a good reminder to me that it's not always about what you want to brew; it's about what will sell, what people want. They have been very useful to have on tap at Crafty Chameleon. If a cider is too sweet for someone, we can always do a blend of the dry and sweet taps to cut it down. Having a wide variety has been awesome to have. We have used them for everything from drinks to Jell-O shots to cocktails and spritzers."

While Rozanski has found some winning ideas with his ciders at the commercial and homebrewing levels, he admits things don't always work out. Nonetheless, sometimes the Bob Ross method is best.

"I love getting feedback on our current tap selection and pushing the boundary of what is capable. You are only limited by your own creativity. There was an

Kerry Rozanski (left) and Casey Goodman (right).

Brew This!

BASIC CIDER

Recipe courtesy of Kerry Rozanski.

You can change the flavor of this basic cider by substituting another juice (cherry, pineapple, cranberry, etc.) for the half gallon of apple juice used for backsweetening.

Batch volume: 5.5–6 US gal. (20.8–22.7 L)
Original gravity: 1.031–1.033 (7.8–8.3°P)
Alcohol: 4–4.5% by volume

JUICE

4 gal. (15.1 L) apple juice
0.5 gal. (1.9 L) apple juice for backsweetening

YEAST

1 pack Fermentis Safale US-05

ADDITIONAL ITEMS

Fermaid K
potassium sorbate
wood chips, cubes, or spirals of your choice (optional)

CIDERMAKING NOTES

Add 4 gal. (15.1 L) apple juice to a sanitized fermenter and top up with water to 5.5 gal. (20.8 L). Add Fermaid K per manufacturer directions and yeast. Oxygenate and ferment at 68°F (20°C) for 2 weeks. Cold crash cider for 48 hours, then add potassium sorbate per manufacturer directions and continue to cold crash for another 24 hours. Rack fermented cider to a sanitized keg, optionally adding 0.5 gal. (1.9 L) apple juice (or other juice of your choice) to backsweeten. Carbonate and enjoy.

WOOD-AGED VARIATION

After cold crashing, optionally rack fermented cider onto your choice of wood and age for a period of weeks, sampling regularly to evaluate level of extraction. Rack to serving keg when it is to your taste.

Photos © Getty/Ivan_Neru; courtesy of Scott Kurtz

Wood chips for aging the ciders.

experiment I did once that went horribly wrong; I tried to create an alcoholic version of Gatorade. Total failure. Once I figured out the basics of how everything works together and different types of yeast and additives, that opened the door to a whole different level. One of my best experiments was a batch called Happy Accident, 1.5 barrels of 16% [ABV] cider. The batch was split into apple, raspberry, apricot, blackberry, and a blackberry-raspberry mix. It was a good time."

Drawing on that creative spirit, Rozanski approached wood-aged cider with an open mind and ideas.

MAKING PLANS

"I was really excited about this experiment when it was pitched to me. Nobody does anything like this as far as I know. It could be an untapped market that you could put your own twist and creativity on."

Rozanski and I sat down over the summer of 2020 to plan out the project. The main goal we had was repeatability and

Measuring original gravity of the base cider.

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> "I prefer to ferment my ciders dry so I can adjust the sweetness.

easy access to ingredients for anyone looking to make the recipes themselves. After some debate, we settled on mesquite, oak, and pecan wood chips.

"Since this was a project that we wanted to make repeatable, we chose woods that are widely available throughout the U.S. Two of the woods are your basic barbecue smoker chips from the barbecue aisle of your local hardware store. The other wood, Missouri white oak, is leftover scraps from a local foeder maker."

The base cider fermented dry, with an apparent final gravity close to 1.000 (0°P).

Wood chips soaking in vodka.

Wood chips aging in vodka-filled Mason jars.

Mesquite, with its earthy notes and sharp but subtle spiciness, has always been a favorite of mine for grilling, and I had hoped the spiciness would carry through into the cider. Rozanki's favorite was pecan.

To prepare the wood for aging cider, we steeped 2 ounces (57 grams) of each type in vodka-filled Mason jars and let them soak for two weeks. For the cider, Rozanski and his assistant brewer, Casey Goodman, prepped one of Crafty's 3-barrel fermenters using an apple concentrate from a local grain distributor and EC-1118 yeast.

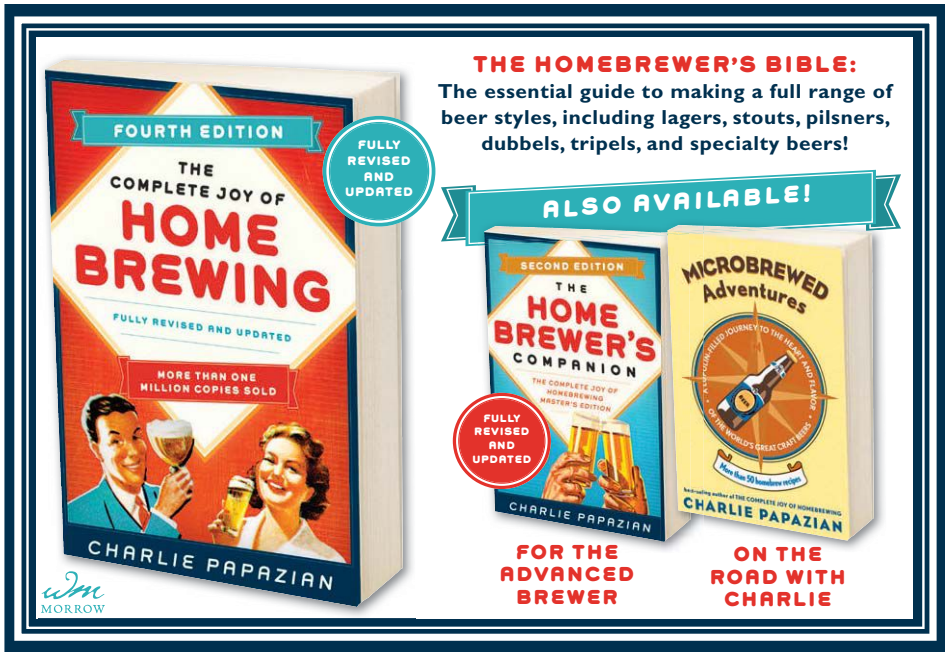
"For the experiment, we'll pull off six 5-gallon kegs of the cider when it's done," said Rozanski. "I prefer to ferment my ciders dry so I can adjust the sweetness easier [*sic*] with either more concentrate or other fruit flavors, so half of those kegs will be backsweetened before adding the wood in. That way, we can see how it works on both ends."

After fermenting and crashing over a two-week period, the cider was ready. The now-sanitized wood chips had created different vodka tinctures, and the color differences between the three types of wood were notable. Oak contributed the lightest color, pecan gave off a bright orange, and mesquite yielded a deep amber. Curious how they tasted, we grabbed small cups and poured flights of the liquor for ourselves, the general manager, one of the owners, and some of the bar staff.

We all had different favorites, but oak came in second for most tasters. One of the owners and I preferred the mesquite liquor for its rye-like spiciness, while Rozanski preferred pecan: "There's a nutty, slightly fruity flavor to it. Really hoping it comes through when it's ready," he said.

Half the Corny kegs were backsweetened as planned, and then each received 2 ounces (57 grams) of wood chips and an even portion of the wood-infused liquor. Then each keg was sealed and left to sit at room

The base cider was aged on three kinds of wood: oak, pecan, and mesquite (lightest to darkest).



temperature for three weeks before being moved to the cooler.

Before we transferred the ciders to the cooler, Rozanski and I took small samples of each keg to see how aging was progressing and to assess any signs of contamination. We didn't pick up any acetic or odd off-flavors, and any color differences we had observed were now indistinguishable. We were, however, able to detect the flavors and aromas from the woods and predict the directions we believed they were headed in.

"The oak character was giving off a slight wine-like character," noted Rozanski, "and the pecan is giving it a fruit note that I'm liking. The mesquite is pretty noticeable, but not in a good way."

And I had to agree. The mesquite provided the most character of all the woods but, to my disappointment, also produced a medium-level earthy note I would describe as "dusty," especially in the dry cider. The sweet cider balanced this out to some degree, but not enough to make a big difference. With high hopes for the oak and pecan, and cautious optimism for the mesquite, the ciders went into the cooler after getting topped off with CO_2 and waited for a tap to open up.

EVALUATION

Four weeks later, I returned to Crafty Chameleon to taste the ciders. After running over to the local homebrew store to replace a missing-in-action ball lock disconnect for the CO_2 line, we poured samples of each cider. The differences from the samples we had weeks earlier were immediately noticeable.

"The sweet pecan-aged cider has a really fruity, slightly peach-like note to it now," commented Rozanski. "The dry half tastes even drier now, but it's a lot more wine-like."

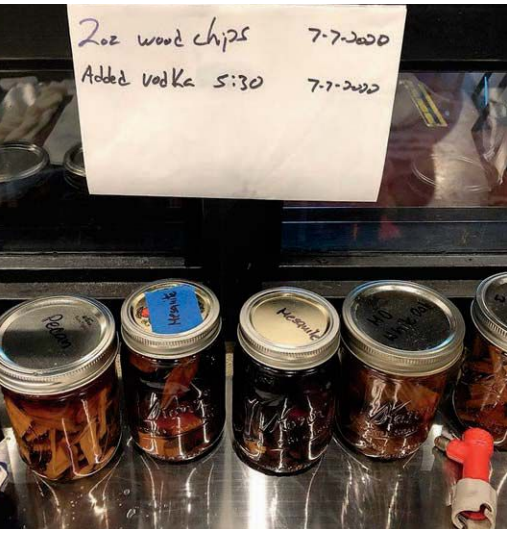
The oaked ciders were similar, with both having picked up a distinct white-wine character. The sweetened batch had a mild, buttery note as it warmed and Chardonnay notes in the finish, unlike the dry half, which had some nice oak tannins and came across as slightly one-dimensional.

The pecan- and oak-aged ciders had continued to improve, but the mesquite-aged ciders had not. The earthy flavors in the dry mesquite-aged cider had grown into a musty note that was difficult to ignore. The sweet version hadn't fared much better and at times seemed at odds with itself.

"The mesquite came through the heaviest of the three," said Rozanski, "and the sweet half feels like it needs more of one or the other between the apple and the mesquite. My favorite of all of these right now is the pecan-aged sweet cider."

My vote at the time was for the oak-aged sweet cider, but the sweet half of the pecan-aged was pretty close. At that time I decided to use a pinch of malic acid in the oak-aged ciders, and the difference was immediate in the dry version. The flavors brightened and yielded a much crisper finish than before, not unlike a Granny Smith apple.

With this in mind, we invited two bartenders and two owners to try everything out. Unsurprisingly, the mesquite ciders were not a resounding favorite, with one



Wood-infused vodka.

Apple juice going into the kettle.

Brew This!

Imperial Cinnamon Spiced Cider

Recipe courtesy of Kerry Rozanski.

Batch volume: 4–4.5 US gal. (15.1–17 L)
Original gravity: 1.061–1.069 (15–16.8°P)
Alcohol: 9–10% by volume

JUICE

4 gal. (15.1 L) apple juice
0.5 gal. (1.9 L) apple juice for backsweetening

YEAST

1 pack Fermentis Safale US-05

ADDITIONAL ITEMS

2 lb. (907 g) light brown sugar.
10 or more cinnamon sticks
Fermaid K
potassium sorbate
wood chips, cubes, or spirals of your choice (optional)

CIDERMAKING NOTES

Add 4 gal. (15.1 L) apple juice and 2 lb. (907 g) light brown sugar to a sanitized fermenter, vigorously shaking or swirling to dissolve sugar in the juice. Add Fermaid K per directions and US-05. Oxygenate and ferment at 68°F (20°C) for 2 weeks. Cold crash cider for 48 hours, then add potassium sorbate per manufacturer directions and continue to cold crash for another 24 hours. Add cinnamon sticks and 0.5 gal. (1.9 L) juice into sanitized keg and rack fermented cider on top. Carbonate and enjoy.

WOOD-AGED VARIATION

After cold crashing, optionally rack fermented cider onto your choice of wood and age for a period of weeks, sampling regularly to evaluate level of extraction. Rack to serving keg when it is to your taste.

of the bartenders describing it as "bark-like" and "smoky like a bonfire," while one owner commented that they tasted "very rustic and musty." We then added malic acid to the mesquite ciders simply out of curiosity, and while it did manage to improve them, sales expectations for these remained low.

The oak-aged ciders were in the middle of the field all around, with both bartenders and owners noticing the wine-like notes Rozanski and I had detected and saying it had that "traditional" cider taste everyone expects. One of the bartenders also said she felt the sweet half had a "fruitier complexity" and a "fuzzy texture that wasn't there in the dry version." After adding malic acid to those samples, everyone agreed it drank more like a wine than a cider, but that wasn't a detractor in their minds.

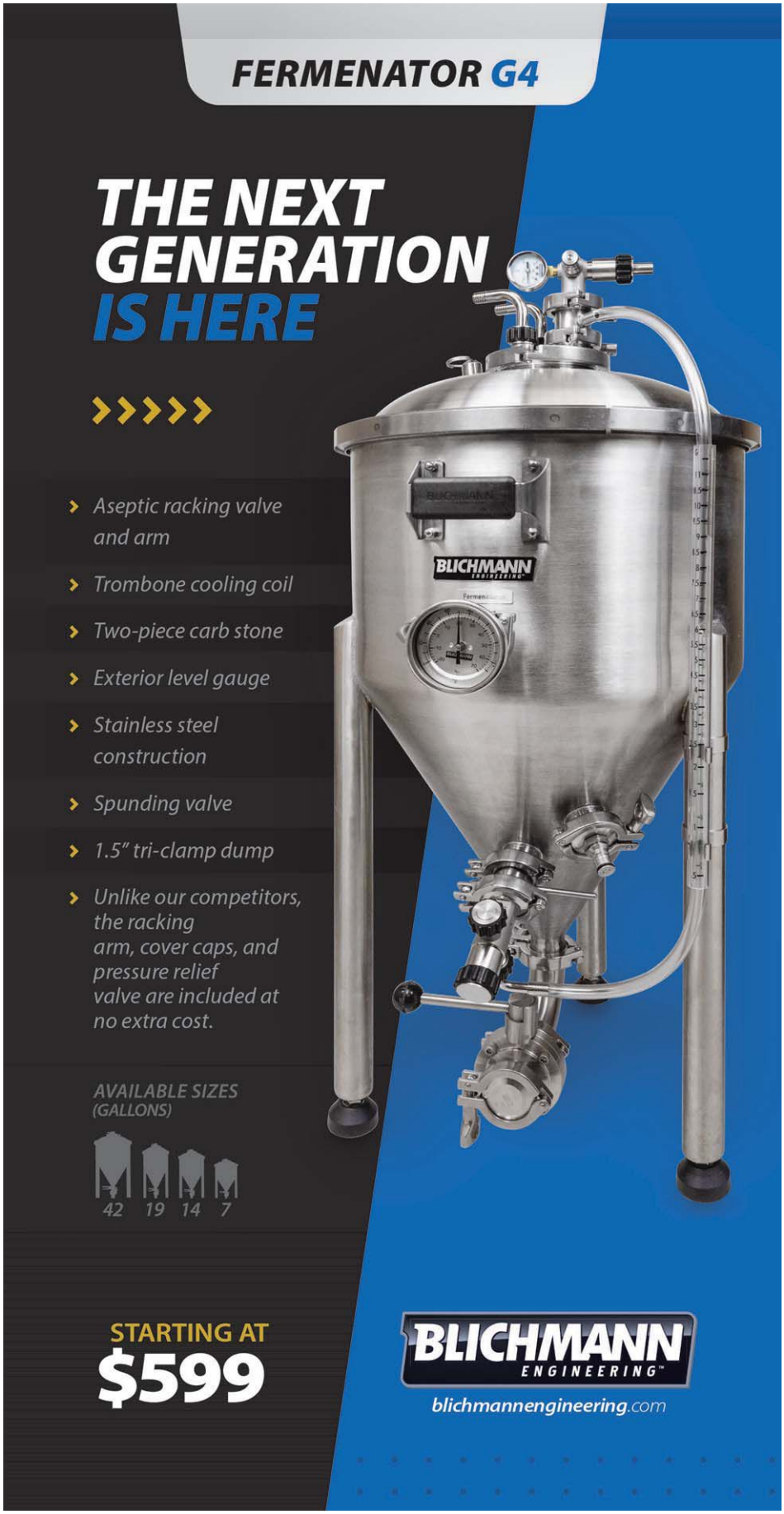
Overall, the group preferred the pecan-aged ciders. One bartender said the sweet pecan-aged half had "perfect balance and [one] could really get the wood and apple flavors clearly," while the other bartender said she felt like she could taste an extra fruit or two in it. Both owners enjoyed it and immediately began looking forward to finding out how customers would respond to it.

Overall, Rozanski feels the experiment was a success, and he feels the ciders will do well once the kegs are tapped.

"I'm still really surprised how a little bit of wood went a long way. The flavor and color changes were a surprise as well, especially on the mesquite-aged cider. It's got me thinking about possibly doing this again down the road in bigger batches. If we do that, though, it'd likely be through barrel-aging, though. We could possibly do it in a wine barrel for one of our fruited ciders; that could be interesting."

There's no limit to what you can do with cider. There's plenty of room for creativity, but aging in wood demonstrates that traditional methods will always have their place.

Scott Kurtz is a BJCP Certified Beer and Mead Judge from St. Louis, Mo. He is the founder of the St. Louis Area Homebrewers Guild homebrew community, former commissioner of the St. Louis homebrew clubs officer's council, former vice president of STL Brewminati Homebrew Club and the meadmaker at Bluewood Brewing in St. Louis.



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 *ZYMURGY*

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.

Photo © Jesse James Galarza

Brew Lingo

Every field has specialized language, and homebrewing is no different. Here are a 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 bittering 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)

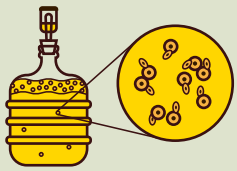
SMaSH – single malt and single hop

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 CO_2.
- 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 CO_2 to g/L, multiply by 2.

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

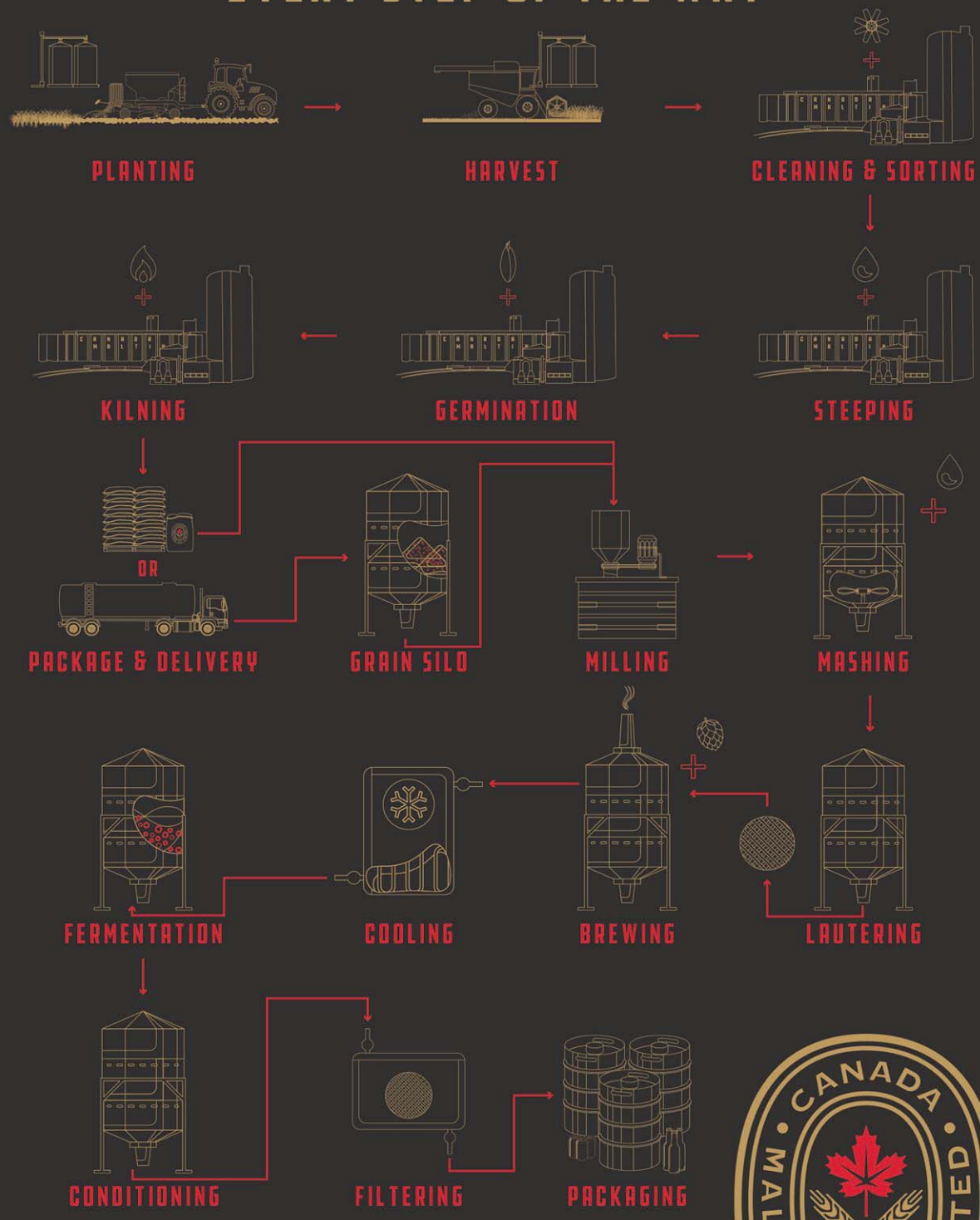
TEMP. (°F)	VOL. CO_2 2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
33	5.0	6.0	6.9	7.9	8.8	9.8	10.7	11.7	12.6	13.6	14.5
34	5.2	6.2	7.2	8.1	9.1	10.1	11.1	12.0	13.0	14.0	15.0
35	5.6	6.6	7.6	8.6	9.7	10.7	11.7	12.7	13.7	14.8	15.8
36	6.1	7.1	8.2	9.2	10.2	11.3	12.3	13.4	14.4	15.5	16.5
37	6.6	7.6	8.7	9.8	10.8	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

Source: Brewers Association Draught Beer Quality for Retailers

FROM FARMER TO BREWER

WE NURTURE DEEP-ROOTED RELATIONSHIPS EVERY STEP OF THE WAY



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Valkyries Horn Mead Competition

The First Virtual Mead Competition

By Matt Weide

It is not easy to think about conducting homebrewing competitions during a pandemic. However, as we all spent more time at home it seemed like the challenge would be a welcome distraction. With that in mind, last spring a small group of homebrewers set out to find out what was possible. Al Boyce (BJCP Grand Master VII) led the charge in starting a white paper on how a contest could be conducted with safety in mind. After several meetings and reviews of the document, our small group found that the most challenging portion of this new way of conducting a competition would be the judging itself. →

Photos © Getty/biffspandex (wing); Getty/vzwer (horn); Getty/Korkiat (sky)

That small group pursued a path to ensure that judges could evaluate entries from home without having to sit in close proximity in a large hall, with multiple hands touching the same bottles. We set up a trial using a virtual bottle share event with the Minnesota Home Brewers Association and tried several online meeting platforms. We gathered feedback on what worked and what didn't and reviewed some of the lessons learned with the Valkyries Horn board.

With the initial trial complete and understanding what it would take to judge while respecting the CDC guidelines, the Valkyries Horn board met. Kevin Meinstma, Garrick van Buren, Josh Mahoney, Dave Royer, Ryan Richardson, Al Boyce, and Matt Weide comprised the board. We voted to go forward with our 2020 competition using a virtual judging format.

First, we established processes for setting up a website and accepting entries, all the way to announcing the best of show (BOS). We capped entries at 250 and, assuming entrants would be leery of shipping lots of bottles, decided to require only three bottles: one per judge in each judging pair, plus one for the best-of-show round. We decided best of show could be judged by just one individual with a very experienced palate. Luckily, Ken Schramm from Schramm's Meadery agreed to be our BOS judge.

We were also fortunate that one of our board members, Dave Royer, was able to set up an online judging system, eliminating the need for organizers to collect and touch paper judging sheets. All judges were asked to attend a virtual judging training session to ensure everyone was comfortable with the new format and on the same page. Judging online naturally meant a computer would be available to judges, a nice benefit of conducting a virtual competition.

Typed scoresheets meant entrants could read judge feedback more easily. Many judges also appreciated not having to drive to a judging site once they had picked up their entries to evaluate. This shortened the total time needed to judge and kept everyone safe at home. Judges also voiced appreciation for being able to schedule judging times at their leisure instead of having to give up a weekend evening or afternoon.

We also reviewed other considerations, including prizes. In light of the stresses that COVID-19 had thrust upon most of our sponsors, the board decided not to ask for donations from previous years' sponsors. This also helped reduce the amount of contact volunteers and entrants would have in shipping materials to and from different locations. Valkyries Horn did, however, include last year's sponsors on our help page as a nod to past supporters and to encourage website visitors to patronize those businesses.

Brew This!

Yumm!

Blackberry-raspberry melomel

Recipe courtesy Tom Weber.

This recipe, as produced for the competition, achieved the one-third sugar break (1.031 or 7.8 Brix) in 3 days. The pH on the second day was 3.34, so 2 tsp. of potassium bicarbonate was added to raise the pH to 3.65. There was no degassing. Fermentation was vigorous and finished in 7 days.

Batch volume: 5 US gal. (18.9 L)
Original gravity: 1.044 (11°P)
Final gravity: 0.995 (–1.3°P)
Alcohol: 6.4% by volume

HONEY & FRUIT

6 lb. (2.72 kg) raw honey
8 lb. (3.63 kg) Caroline raspberries
4 lb. (1.81 kg) frozen blackberries

YEAST

10 g Lalvin 71B

ADDITIONAL ITEMS

12.5 g Go-Ferm for rehydrating yeast
4.3 g Fermaid-O, divided into 2 equal additions
1 Tbsp. bentonite in primary
5 tsp. pectic enzyme
sulfite and sorbate as needed

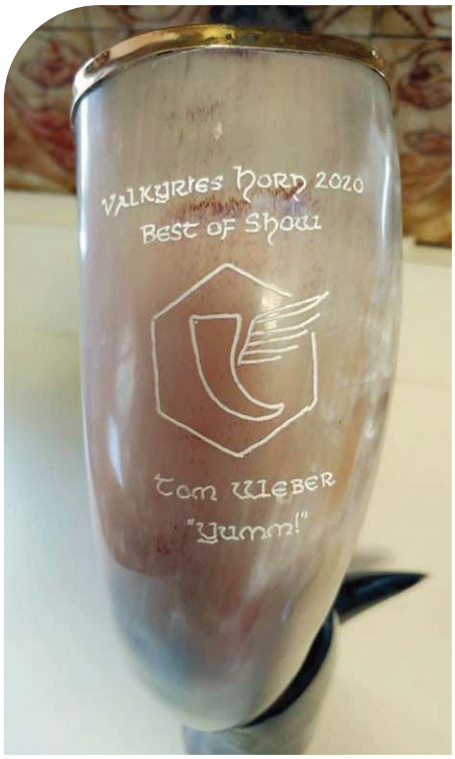
MEADMAKING NOTES

Rehydrate yeast in 250 mL warm water with Go-Ferm. Dissolve honey in enough warm water to make 5 gallons of must, and then add the berries. Oxygenate must 90 seconds with pure oxygen before pitching yeast. Add bentonite, pitch yeast, and ferment at 64°F (18°C).

Add 2.15 g Fermaid-O 24 hours after pitching yeast and the remaining 2.15 g 48 hours after pitching yeast (i.e., 24 hours after the first addition). Punch down the fruit cap every day for 5 days, and then remove the fruit on the 6th day.

When fermentation is complete, cold crash for 2 days and then rack off sediment to a clean, sanitized vessel. Add pectic enzyme, sulfite, and sorbate.

Back-sweeten to taste. When mead clears, rack off sediment and keg to preferred level of carbonation.



Valkyries Drinking Horn best-of-show trophy.

Photos courtesy of Tom Weber (horn trophy); Chop & Brew (virtual screen)

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Pictured: Ryan Richardson (top) and Chip Walton (bottom).

We did, however, give each judge two bottles of commemorative mead created by members of our board, as well as a coupon for a free mead at White Bear Meadery.

Once judges had chosen first-place meads, the entries needed to get to Ken Schramm in Michigan. We certainly could have shipped the box of BOS meads to Ken, but we were worried that the entries could break, not be stored under ideal conditions, or not show up at all. Valkyries Horn competition chair Kevin Meinstma volunteered to personally drive the first-place meads to Ferndale, Mich., to ensure they made it in good condition.

Ken created a video that included a tour of his meadery and answers to questions from volunteers and entrants. He also offered a guided tasting of Schramm's "The Statement" Lutowka Cherry Mead and, finally, a BOS tasting, in which he described his top five meads and explained how and why he chose them. Ken provided this video to Valkyries Horn so we could edit in the category winners, and then we played it at the awards ceremony.

The competition received much positive feedback from judges, entrants, and volunteers alike. We judged 197 entries from 218 participants in 16 different groups with 48 medals awarded. Ken Schramm provided about an hour of excellent video and invaluable insight into how he judges mead and what influenced his decisions.

Ken chose Tom Weber's "Yumm!", a raspberry-blackberry mead, as the best-of-show winner. Although Tom couldn't be there to accept his Valkyries Drinking Horn trophy, the Valkyries Horn board did have the horn personally inscribed, which is not possible in a traditional competition. It also would have been much more difficult in a traditional setting to have a front-row seat to Ken Schramm's judging your mead and pronouncing it best of show!

Thank you to Ken, the entrants, and all the volunteers who made our first virtual mead-only competition a success.

RESOURCE

- Conducting Virtual Homebrew Contests: mnbrewers.com/resources/conducting-virtual-homebrew-contests

Matt Weide serves on the American Mead Makers Association home brewing board and is a member of the Minnesota Home Brewers Association. He was the 2014 AHA Meadmaker of the Year and is a founding board member of the Valkyries Horn mead competition.

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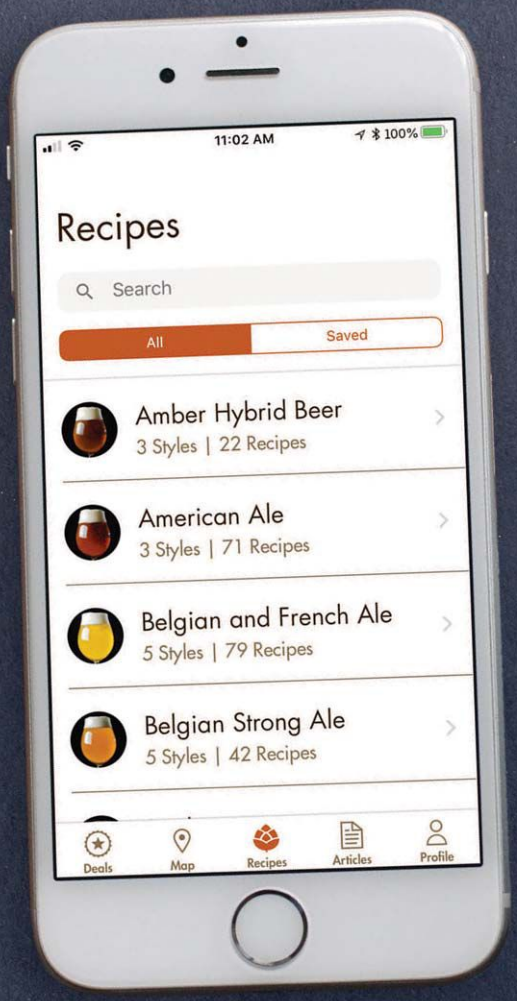

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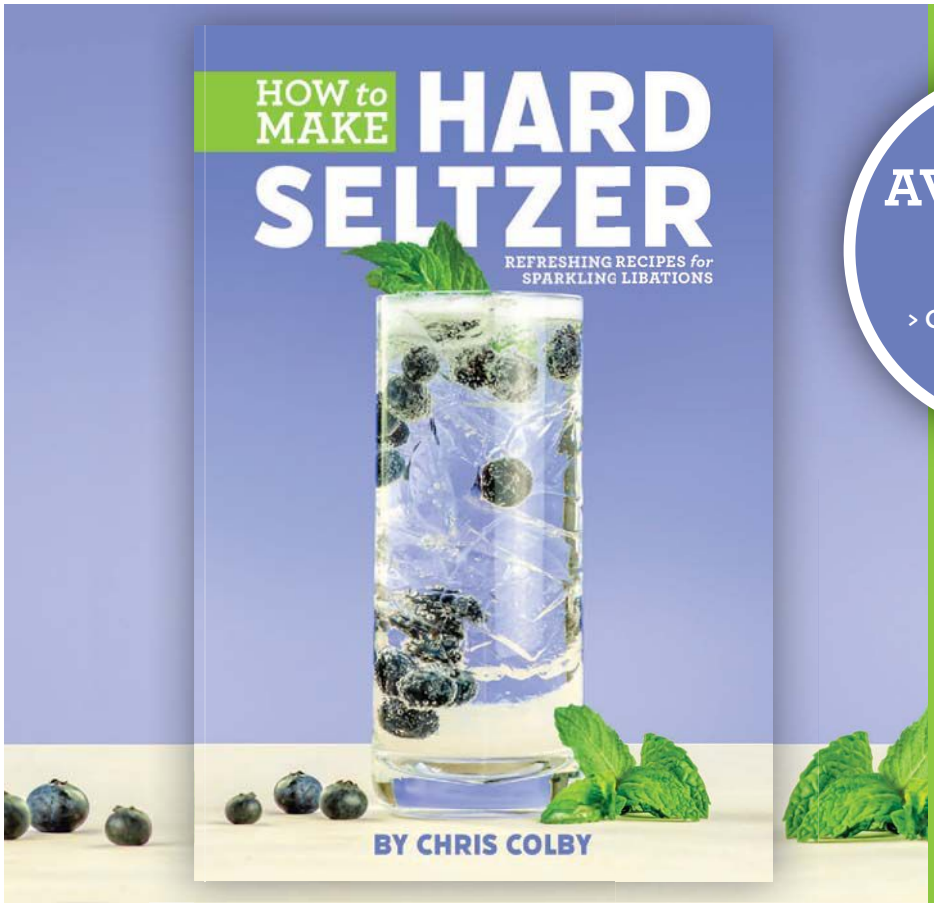

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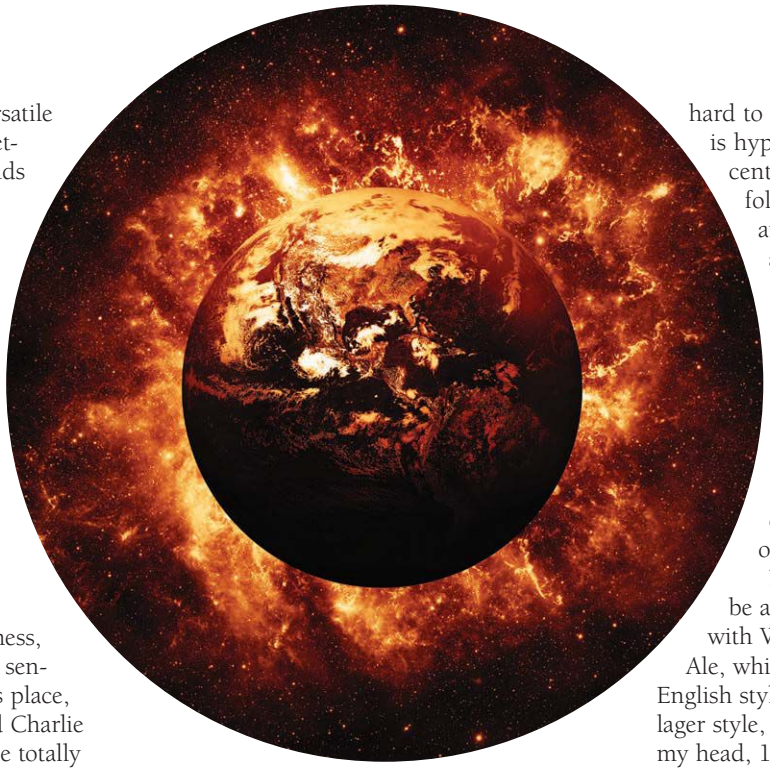
Scorched Earth, a Smoked American Red Ale



Rauchbier, that wonderful, versatile German style of smoke, sweetness, and perfect wonder sends me to the patio dreaming of ribs, a pork butt, a brisket—anything smoked. It's the ideal balance of smoke and malt, an overlooked and underestimated champion, and a fantastic beer to use in beef stew or for simmering brats. Built on a delightful combination of smoked malt, a touch of crystal malt, just enough hops, and a semi-neutral yeast, it's a ballroom dance in a glass.

I started wondering how far I could take smoked malt without reaching the point of obnoxiousness, that dreaded "licking an ashtray" sensation. So, starting at the obvious place, I looked to see if our good friend Charlie Papazian had tackled this one. He totally had in a beer called Rogerfest, which you'll find in the Sept/Oct 2009 issue of *Zymurgy*. Charlie's tribute to the late Roger Briess used an incredible 60 percent Briess Cherry Wood Smoked Malt in the grist.

After looking at Mr Papazian's recipe, I thought, *Well, why the heck not?* So I went down that rabbit hole and fell in love with this particular smoked malt. Along the way, I discovered I don't want an overly smoked ale, but rather a balanced, sweet beer with undertones of fruit. Thank you, Charlie. I did not take mine quite as far as he did, but I got pretty close.

As a reenactor and living historian of the Civil War, I tend to think of names and styles that I would like to have while sitting around the fire and telling stories. I thought of General William Tecumseh Sherman's 1864 March to the Sea and the smells and tastes his 62,000 men must have experienced while marching from Atlanta to Savannah.

I kept coming back to salt pork, bacon, and campfires. What developed is a beer I call "Scorched Earth." Brew it up, have a pint while grilling or smoking something on the patio, and let your adventure in brewing march onward. I wish I could take credit for the name, but that goes to my wife Susan.

Using cherrywood-smoked malt to create this wonderful beer was amazing, and the smell from the mash tun—oh my! Easy to drink, a joy to smell, and a multitasker in the kitchen, it makes a great marinade for jerky, a nice addition to beef stew, or a replacement for broth in slow-cooker pulled pork. It even makes a nice barbecue sauce.

With all the choices we have today, choosing the right smoked malt can be tricky, a decision that also depends on how much and what type of smoke you wish to highlight in your beer. I chose Briess's Cherry Wood Smoked Malt for its sweetness and slight fruit characteristics. It also works nicely in Scottish styles in amounts of less than 10 percent of the grist.

I started with cherrywood-smoked malt to the tune of 55 percent of the grain bill. Do not be scared of it—yes, it is smoky, but it has a sweetness like no other, smelling of bacon with a touch of fruit that's hard to explain. Just smelling the malt is hypnotizing. I also added 35 percent Briess Ashburne Mild Malt, followed by a few others for color and malty sweetness: 5 percent aromatic malt, 4 percent caramel 120°L, and 1 percent chocolate rye malt.

To complement the smoky, sweet, and fruity notes of the smoked malt, I selected kettle hops additions of Palisade at 30 minutes and 10 minutes, followed by Fuggles at flame-out for its earthiness and hints of tobacco.

Deciding on a yeast proved to be a bit tricky. Ultimately, I went with Wyeast 1469 West Yorkshire Ale, which is my go-to strain for malty English styles. Yes, rauchbier is a German lager style, but as this beer developed in my head, 1469 kept making its way to leader of the pack. It turned out to be the perfect choice for bringing forth some stone-fruit esters and a nutty characteristic that plays so well with the malts and hops. It also clears very nicely. Wyeast 1007 German Ale would also pair nicely. I fermented this smoked ale at 66°F (19°C).

So, if you want to get in the virtual DeLorean and travel to a place where we don't need roads, check out the recipe in the Now on Tap section on page 11 of this issue of *Zymurgy*. Brewing it will introduce you to a wonderful beer style done differently, one that pushes smoked malts to the extreme. Come along and give it a try. Happy brewing!

Ryan D. Kriesch has made beer and wine for 11 years and mead for two. He is a passionate cook, brewer, and father with a touch of nerd to balance the natural jock—no board game off limits. Brew what you want, and remember that the best beers are brewed from the heart and not for a medal. When in doubt, brew it up, have a homebrew, and support your local breweries and homebrew shops.

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