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NOVEMBER 2021, VOL.27, NO.7

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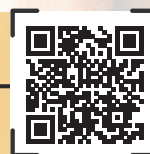
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by Luke Pernotto

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by Dan Russo



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## RECIPE STANDARDIZATION

### EXTRACT EFFICIENCY: 65%

(i.e. — 1 pound of 2-row malt, which has a potential extract value of 1.037 in one US gallon of water, would yield a wort of 1.024.)

### EXTRACT VALUES FOR MALT EXTRACT:

liquid malt extract (LME) = 1.033–1.037  
dried malt extract (DME) = 1.045

### POTENTIAL EXTRACT FOR GRAINS:

2-row base malts = 1.037–1.038  
wheat malt = 1.037  
6-row base malts = 1.035  
Munich malt = 1.035  
Vienna malt = 1.035  
crystal malts = 1.033–1.035  
chocolate malts = 1.034  
dark roasted grains = 1.024–1.026  
flaked maize and rice = 1.037–1.038

### HOPS:

We calculate IBUs based on 25% hop utilization for a one-hour boil of hop pellets at specific gravities less than 1.050. For post-boil hop stands, we calculate IBUs based on 10% hop utilization for 30-minute hop stands at specific gravities less than 1.050. Increase hop dosage 10% if using whole leaf hops.

### Gallons:

We use US gallons whenever gallons are mentioned.



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**Q**

**What's the most common fault you see in homebrewed beer?**

✱  
 Nowadays, it's probably oxidation. It used to be various fermentation-related faults, but homebrewers in general have improved their game over the years. Now I see more packing or handling faults.

✱  
 The art and science of making beer only requires four ingredients. We have endless possibilities. Some brewers become a bit too fascinated with multiple hop varieties or too many specialty malts and the resulting beer can be a muddled mess if those ingredients are not used carefully. Nothing wrong with having fun with something unique, just don't overdo it. I think palates are trending to Pilsner and such. The pendulum is in swing.

✱  
 Maintaining correct fermentation temperature. Craft breweries usually use glycol-wrapped tanks, which allows for precise temperature control. Homebrewers usually have to rely on blankets, fridges or freezers, and many other devices. Correct temperature control will bring out the best yeast flavors, and keep the bad ones below flavor threshold.

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**Brew-In-A-Bag Techniques**

Many countertop brew systems operate in a manner akin to brew-in-a-bag homebrewers. Get some pointers on making the most of your brew day when starting out on a new brew-in-a-bag style system. <https://byo.com/article/brew-in-a-bag-techniques/>

**MEMBERS ONLY**



**Kettle-Souring Keg**

Kettle souring has become very popular because of the time savings and lower risk of contaminating the brewery compared to other souring techniques. However, the process comes with its own cons too. This DIY "kettle" souring keg solves those problems. <https://byo.com/article/the-lacto-lounge/>



**Kveik Tips From the Pros**

When American craft brewers got their hands on the fast-fermenting kveik strains from Norway they immediately started using them to quickly turn around IPAs. However, IPAs (and the traditional Old World styles from their home countries) aren't all these unique yeasts do well. <https://byo.com/article/kveik-tips-from-the-pros/>

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**Australian Sparkling Ale**

Australian sparkling ale was added to the Beer Judge Certification Program Style Guidelines in 2015, but it's been brewed in Australia since the 19th century to compete against pale ales imported from England. <https://byo.com/article/style-profile-layout-3/>

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## SESSION CIDERS

I'm looking for a hard cider yeast that produces no more than 5% alcohol. What do you recommend?

Daniel Hyatt • *via email*

*We wouldn't rely on a specific yeast strain to keep alcohol levels below your threshold . . . we would rely on math and adding water to the juice if the starting sugar levels are too high. A typical cider is estimated to finish at about 0.998 specific gravity (because unlike beer, almost all the sugar in apple juice is fermentable). To achieve 5%, that means you'll want the starting gravity of the juice to be no more than about 1.036, or about 9 °Brix. Some simple math based on your juice volume and how much you need to dilute the gravity down will bring you to your volume of water required.*

*Now with that said, you could look to play around with yeast strains and their effects on the finishing gravity. You may want to start by checking out the new lineup of cider-specific yeast strains from Fermentis – <https://fermentis.com/en/fermentation/active-dry-yeast-cider/safcider/> – but there are plenty of other cider-specific strains out there, and many cidemakers will opt for beer or wine yeast as well. Overall, they won't make a significant difference in finishing gravity on a cider like yeast selection in beer can have.*

## STEEPING SPECIALTY MALTS

Can I mash my standard malts and steep the specialty malts (I'm an all-grain brewer)? If so, where/when would I add the steeped water? Or should I just continue to add the specialty malts at the end of the mash?

Paul Parker • *via email*

*BYO Recipe Editor Dave Green responds: "This is a really good question and you could possibly approach it from different angles. You could do the steeping grains separately and add that 'tea' to the main mash . . . but my question would be: Why? That's just one more vessel that you need to clean (I'm all about minimizing my cleanup needs). Gordon Strong always advocates for adding darker steeping grains such as darker crystal malts and roasted grains at the very end of the mash, as the lautering process begins. This is to help minimize the leaching of polyphenolic compounds from the husks of roasted grains, which can lead to a harsher, more astringent stout*



**Paul Crowther** is a beer writer and homebrewer based in Newcastle, England. He has a regular homebrew piece in *Pellicle Mag* and bylines in *Vittles* and *Ferment*. He enjoys pushing the boundaries of homebrew and making innovative and unusual new brews.

Paul lives with his wife, son, and three rescue dogs. He is a keen gamer and loves long walks in the country. He can often be found wittering about beer and politics through his twitter persona the mad brewer. (@themadbrewery)

Paul makes his *BYO* writing debut on page 42 chronicling his journey in creating a recipe for Heisler, Hollywood's most famous fictional beer that has appeared in more than 100 television series and movies.



**Danny Wood** is an Australian-based journalist who lived in Kansas City, Missouri, for a decade before moving home with his family. He's made wine in his basement, worked in wineries, and is a former Editor

of *Midwest Wine Press*. He also studied enology while in the United States and judged the occasional wine competition, but was really smitten by vino (and his American wife) while living in Spain, reporting for *BBC News*. Danny is a frequent contributor to *Brew Your Own's* sister publication, *WineMaker* magazine, and it didn't take much convincing to get him on board to visit some breweries and homebrew shops to report on the developing beer trends taking place in Australia. That story begins on page 48.



**Dan Russo** began working for Oakshire Brewing in 2013 as the Opening Manager of its Eugene, Oregon Public House. In 2014 he was awarded a scholarship to the American Brewers Guild from the Glen Hay Falconer Foundation. Upon completing the program, he moved onto Oakshire's production team to chase his dream of creating delicious fermented libations. Dan took the helm as Director of Brewing Operations at the beginning of 2017 and has since curated a brewing program that creates over 50 new beers a year. In his spare time he loves to camp, see live music, and runs a burger pop-up with his partner, Diane.

A couple of years ago Oakshire Brewing began producing smoothie sour beers, which quickly became highly sought-after releases. In his first article for *BYO*, Dan details how homebrewers can create these flavor-filled beers at home, beginning on page 62.



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# MAIL

or porter. I personally like some contact between the roasted grains and the amylase enzymes of the mash since many roasted grains may still contain some lower levels of starch (starch that survived the intense roasting process) that the amylase can work on.

"Another factor to consider is your water's carbonate/bicarbonate levels. If you have harder water, adding these darker steeping grains to the mash may actually be beneficial for the mash pH. A water calculator would be your guide there though.

"So there is nothing saying you couldn't do a separate steep, but personally I don't see a benefit in it. But if you do go for it, just make sure the grains are true steeping grains and not ones that actually should be mashed (like a Victory®, amber, or acidulated malts)."

## FERMENTING FLANDERS SOUR ALES

The Flanders Red recipe from the November 2020 "Style Profile" only discusses a primary fermentation. A lot of recipes that I have seen do a primary fermentation with a neutral yeast and a secondary with the yeast you recommend in your recipe – Wyeast 3763 (Roeselare Ale Blend). Have you found that performing a secondary is unnecessary for this style?

Marc Kovach • via email

Gordon Strong, who created that recipe, responds: "The Wyeast

Roeselare blend is a mixed culture of six yeast and bacteria strains, and is capable of producing the Flanders red character on its own, given time. I haven't found that it's necessary to pitch additional yeast. Part of the character of Flanders red comes through a long maturation, so you have to give it that time to work."

A recommendation is that you may want to rack off to a secondary vessel though (get it off the primary yeast near the end of primary fermentation) prior to the long-term storage. As Gordon states, no additional yeast/bacteria should be necessary.

## DREAMING OF THE FINER THINGS

Thought y'all would like this picture of Hopper.

Kevin Seely • via email

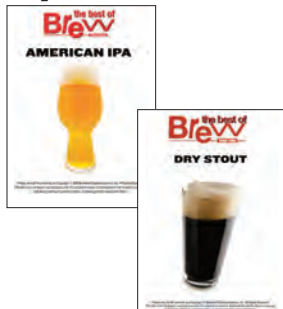


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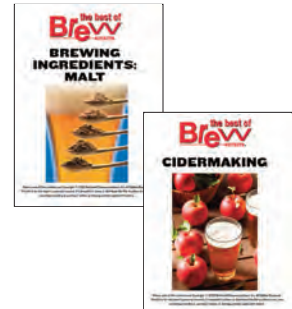
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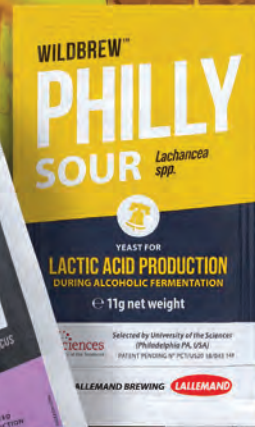
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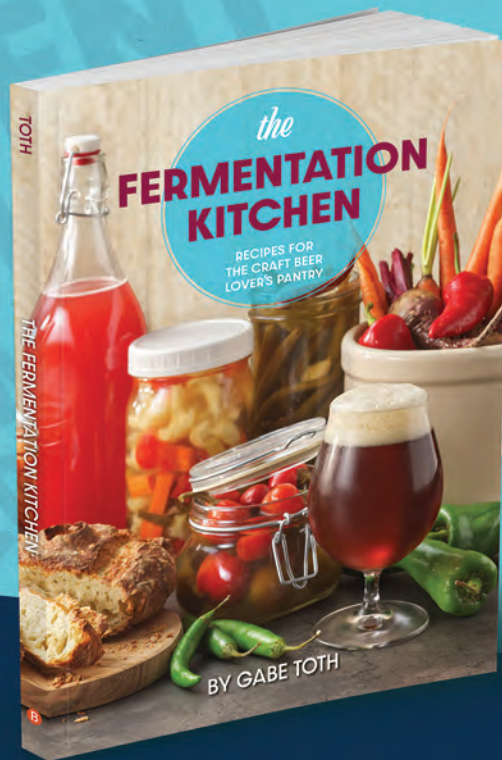
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## BEGINNER'S BLOCK

BY DAVE GREEN

# CLONING A FAVORITE BEER

**H**omebrewers use the term “cloning” as the most common way to describe what we are trying to do when we attempt to make a replica of a favorite commercially available beer. The best way to do this is to get the recipe right from the brewer’s lips and then scale down to your brew system. If you use the same ingredients and the same process then it should yield the same results, right? Reality is that the answer is no. Many details like water profile, hop profile, and yeast dynamics can play a big role in the final beer’s character. For these reasons, you should never truly be disappointed in a clone attempt, especially if the beer you make is still really good . . . even if it’s not a close match. But there are some things we can control to get close. And at worst, it’s a fun endeavor.

### COMING UP WITH A RECIPE

Once you settle upon a beer that you would like to try to recreate, the first step is to develop a recipe. This will often be the most involved process as there are a lot of nuances to consider. The obvious first stop should be a visit to [Byo.com/recipe](http://Byo.com/recipe) to see if you’re in luck and we have a recipe for the beer you’re looking to clone. Also take a look at the brewery’s website to see if they share any clues to the ingredients. Some of the common information that is published includes OG, ABV, IBU, and hop varieties. If you’re lucky, some breweries will even provide details for homebrewers. But if you strike out on both of these fronts, a general web search will hopefully provide some clues or even a recipe, but considering there are now hundreds of thousands of beers that have come and gone through the years, there is a good chance you may come up empty.

No matter what, a little primary research of your own is not a bad thing.

If the brewery is nearby, make a pit stop. A lot of smaller breweries may have their grain bags in full view of the public. Make note of the various types of specialty malts they’re stocking. If someone is available to chat, even if it’s the bartender, see if you can glean some information. I often like to try to come up with a recipe on my own using as much information as I can gather, then, as a final step before brewing, send it to the brewer to see if they could provide some feedback.

If the brewery is kind enough to provide details, hopefully you can get the grain bill as percent malts and the hopping rate per barrel. Then you can scale to your batch size and system efficiency. And be sure to thank them effusively. If all else fails, email the Replicator ([replicator@byo.com](mailto:replicator@byo.com)).

### GETTING THE INGREDIENTS

So now that you’ve spent hours researching (hopefully including having a few samples of the target beer for “scientific” purposes of course) and you’ve come up with a recipe, it’s time to procure the necessary ingredients. But the recipe calls for Crisp 77L crystal malt and your local homebrew shop only stocks crystal 60L and 80L. It’s at a time like this that you need to figure out how dedicated you are to the cause. Are you going to be a purist or are you going to “good enough” it? That’s up to you, but again, I’ll argue that there are so many other factors that are going to alter the flavor profile enough that I may just go for the 60L/80L mix or just 80L. However, opting for a basic North American 2-row pale base malt versus Maris Otter pale ale base malt may make a large, noticeable impact. You will need to draw a line in the sand somewhere.

Hops are going to be one of the biggest factors that homebrewers have to contend with when cloning hop-forward

beers. Many of the bigger breweries get to select their hops right from the fields. That often means they get prime selection while homebrewers will get those lots that were not selected. The good news though is that hop growers have gotten extremely good at what they do and even the “leftovers” can be very high quality these days.

When it comes to water, try to get as much information as you can on this matter from the brewery. Building a water profile up from reverse osmosis water would be ideal. Also, it’s fun to experiment with various salt additions.

Yeast can be tricky as well since their metabolism and the characteristic flavors can change depending on things like fermenter height. Those big fermenters seen at breweries change yeast by-products when compared to our smaller, homebrew-sized fermenters. You can use the same exact yeast strains they use, same exact ingredients, same water profile, and still end up with a beer that doesn’t match.

### THE DEVIL IS IN THE DETAILS

Just like in the prior section, your brew-day techniques for this beer are not going to match what the professional brewer is doing. But honestly, does it matter that much? The key is to keep it fun and realize you’re brewing beer . . . in other words, it’s a good day. Use sound brewing techniques, the kind a professional brewer may use, but don’t feel like you need to go overboard. Just because Sierra Nevada sparges their mash tun with carbon dioxide prior to mashing in, doesn’t mean you need to for brewing their Pale Ale clone. If all goes well, you should land in the ballpark of the beer you were trying to clone. Heck, you may actually get really close to matching the flavor profile. But if not, take notes and don’t be deterred to give it another go.



# STAY-AT-HOMEBREW LABELS

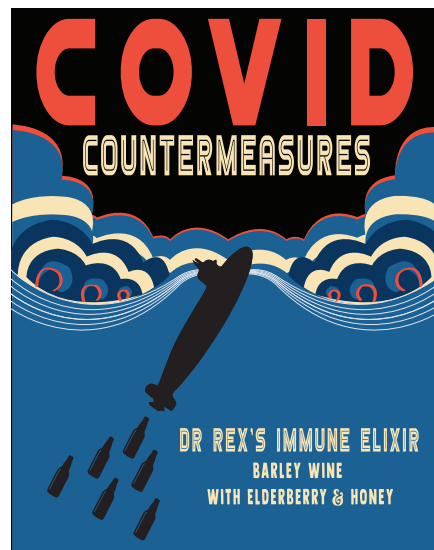
Many *BYO* readers around the globe used the COVID-19 stay-at-home orders to pull out their brew kettles and crank up their homebrewing to pass the time. As a result of all this increased pandemic brewing, we saw quite a few timely homebrew labels submitted to our 26th Annual Label Contest. Here are just a few of our favorite pandemic-themed homebrew labels from readers.



**Norihiko Ishizaka**  
Osaka, Japan



**Scott Peters**  
Tega Cay, South Carolina



**Rex Morgan**  
Mount Pleasant, South Carolina



**Kathleen Stein**  
Big Flats, New York



**Maryann Stoorvogel**  
Clinton Corners, New York



**Joe McClendon**  
San Jose, California

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# WHAT'S NEW



## OMEGA COSMIC PUNCH™ OYL-402

Omega Yeast has launched a new series of yeast strains and Cosmic Punch™ is the first in this new Thiolized™ series. As the name suggests the new strains will be geared towards working on hop thiols, specifically biotransformations on the sulfurous compounds that lend highly tropical fruit character to hop-forward beers (think grapefruit, passion fruit, and guava). The parent strain is Omega's popular British V (OYL-011), sometimes referred to as the Boddington strain by some homebrewers. As with the parent strain, they do recommend a good aeration or oxygenation of the wort for pitching to make sure the yeast reaches full attenuation. Expect to get similar performance and haze levels that have made the parent strain

popular, but experimentation of hopping schedule is recommended to play with the biotransformative capabilities of the new strain. Learn more at <https://omegayeast.com/yeast/ales/cosmic-punch-ale>



## ANVIL BREWING HIGH PRECISION BREWING SCALE

A new high-precision digital scale from Anvil Brewing Equipment has a 5-in. x 5-in. (13-cm x 13-cm) weighing surface and a large backlit screen for easy viewing. The scale's weight capacity is 6.6 lbs. (3 kg), meaning it should not be used for purposes like weighing out base grains. But with a precision of 0.05 oz. (0.1 g), it makes the scale ideal for water salt measurements, hops, and specialty grains. It's easy to toggle between ounces and grams and it includes sample trays. There is also a built-in timer so that batteries will not die if left on. Batteries are included. Learn more at: <https://www.anvilbrewing.com/product-p/anv-scale-small-v2.htm>



## THE FERMENTATION KITCHEN

Fermented foods are experiencing a surge in popularity due to potential health benefits and the flavors they provide. Brewer and distiller Gabe Toth has dedicated 15 years to learning and experimenting with the fundamentals of fermented vegetables, condiments, sausage, dairy, meat, bread, vinegar, kombucha, and other live-culture foods. In *The Fermentation Kitchen*, he provides lessons and easy-to-follow information that is both technical and practical. Part how-to guide, part cookbook, and part reference manual, *The Fermentation Kitchen* is a wide-ranging introduction to fermentation for brewers, food enthusiasts, and home fermentationists who want to go beyond just recipes to understand what's happening as their food is transformed. Learn more or purchase at <https://www.brewerspublications.com/products/the-fermentation-kitchen>

# Upcoming Events



## IN-PERSON BYO BOOT CAMP

Denver, Colorado • November 4–6

Join us for three full days packed with in-person brewing learning experiences. You'll have two days of hands-on, small-class learning from brewing experts in your choice of eleven different full-day

workshops. Plus you'll have a full bonus third day of back-to-back seminars from our experts so you have a chance to learn from all our speakers beyond your small-class workshops. We'll also have a post-Boot Camp Denver-Area Craft Beer Reception Thursday and Saturday. [www.byobootcamp.com](http://www.byobootcamp.com)



## LEARN TO HOMEBREW DAY November 6

On the first Saturday in November, thousands of people will gather at Learn to Homebrew Day sites worldwide to brew beer and learn about the hobby of homebrewing.

In 1999, Learn to Homebrew Day was established to promote the most rewarding and delicious activity of all time – homebrewing. Grab some friends, pull together a recipe, and show them the beauty of homebrewing this year. [www.homebrewersassociation.org/aha-events/learn-to-homebrew-day/](http://www.homebrewersassociation.org/aha-events/learn-to-homebrew-day/)



# Happy Holidays

## What's on your list this year?



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**DEAR REPLICATOR,** A neighbor returned this summer from a vacation on the North Shore of Lake Superior, raving about Nordic, brewed by Castle Danger Brewery. She challenged me to find a way to brew something like it. I was unable to readily find a clone recipe, but I did learn that the beer is a modern interpretation of a traditional Finnish beer called sahti, what some say is the world's oldest, continually brewed beer style. Having long ago spent a summer in Finland as a high school exchange student, I am now even more interested in taking up my neighbor's challenge. Might you be able to provide a recipe for this special beer?

Jeff Dahlseid  
Saint Peter, Minnesota



**A** historical style of beer, sahti originates from the northern Baltic Sea region, most specifically Finland. Made with adjuncts such as rye, a unique characteristic of sahti is its use of juniper. A farmhouse-style beer with a lot of flexibility, Castle Danger Brewery of northern Minnesota has created a modern interpretation of this historical style.

Based in Two Harbors, Minnesota, about half-an-hour drive northeast of the port city of Duluth on the North Shore of Lake Superior, the ten-year-old brewery produces both volume and specialty beers for its locals and visitors to the area. And if you're wondering about the name of the brewery, it's actually the name of the next town north along the shore.

Castle Danger's Head Brewer, Bjorn Erickson, provides his own insight on the style and how he and his brewery have interpreted it in the modern age of production brewing.

"Traditional sahti can be all over the board as a farmhouse style of beer, brewed with whatever crops were local and available," said Erickson. "We're inspired by that and we translated it into a recipe that satisfies our customers, which, in northern Minnesota, has a high concentration of Scandinavians. I consider sahti to fall somewhere between Eastern European kvaas and Norwegian kveik farmhouse ales in terms of style."

"We pride ourselves in being a nimble craft brewery that creates a lot of fun, interesting beer styles, being innovative and traditional at the same

time," said Erickson. "We focus on making good beer, giving people what we call the 'North Shore experience.'"

Traditional sahti and Castle Danger's take on the style have some things in common, but they are not exactly a match. Erickson does employ modern processes and ingredients in his rendition. Traditionally, sahti was a cloudy, unfiltered beer, brewed with juniper branches that provide the beer's bitterness. Little or no boil would have made the use of hops virtually pointless and since yeast hadn't yet been identified, alcohol was created through spontaneous fermentation. Also, being a traditional style, carbonation would have been low to non-perceptible, similar to a cask ale.

In many examples brewed in Finland today, Finnish baker's yeast is used, similar to hefeweizen yeast in character, producing a banana and clove-like aroma and flavor.

The BJCP (Beer Judge Certification Program) guidelines confirm the banana and clove essence as a signature of the style but also show how wide ranging the style can be. The guidelines state, "The beer's color can be anywhere from pale yellow to dark brown." While color is mostly open to the interpretation of the brewer, the beer should be malt-forward with a sweet and/or spicy rye character, with a present, but subtle, pine aroma from the juniper. Carbonation is typically low and the mouthfeel can be thick and tacky. The beer should pack a punch (7–11% ABV) with alcohol warmth expected. Hop flavor and bitterness should be minimal.

### **NORDIC SAHTI**

At Castle Danger, Nordic, the brewery's interpretation of sahti, is a medium amber-colored beer that belies tradition with its white foamy head. Hand-crushed juniper berries are used in place of the branches, and placed in the hopback. A hefty dosing of flaked rye alongside a base of Pilsner malt provides a spicy character, while additions of light crystal and honey malt add sweetness and body.

Noble hops (Saaz and Hallertau) augment the subtle bitterness of the berries and help balance the malt sweetness. The juniper berries provide a distinctive piney aroma and a resinous mouthfeel, less woody tasting compared to when juniper branches are used. Rice hulls can be employed by brewers to help prevent a stuck mash from the sticky rye wort, and a small dose of acidulated malt can be added to keep the mash pH in the proper range.

Castle Danger defies tradition when it comes to its use of yeast and level of carbonation in its sahti.

"We actually use a California common strain of yeast," said Erickson. "It's a warm-fermenting lager yeast. We carbonate Nordic to about 2.6 volumes of carbonation because that's what most local craft beer drinkers expect."

Sahti is a very diverse beer that pairs well with rich foods. Try it along with charcuterie or antipasto. Smoked meats, rye bread with herbed cheese, pickled herring, and other robust dishes also pair well. Serve in a tulip or snifter glass at 40–45 °F (4–7 °C).



## CASTLE DANGER BREWERY'S NORDIC SAHTI CLONE

(5 gallons/19 L, all-grain)

OG = 1.053 FG = 1.011

IBU = 26 SRM = 7 ABV = 5.5%



### INGREDIENTS

8 lbs. (3.6 kg) Pilsen malt

1.25 lbs. (567 g) Briess caramel malt  
(10 °L)

1 lb. (454 g) flaked rye

0.75 lb. (340 g) honey malt

1.5 oz. (43 g) dried juniper berries,  
crushed (20 min.)

5 AAU Saaz hops (60 min.)

(2 oz./57 g at 2.5% alpha acids)

7.2 AAU Hallertau hops (10 min.)

(1.5 oz./43 g at 4.8% alpha acids)

1 oz. (28 g) Fuggle hops (0 min.)

Wyeast 2112 (California Lager),  
White Labs WLP810 (San Fran-  
cisco Lager), or Mangrove Jack's  
M54 (California Lager) yeast

¾ cup corn sugar (if priming)

### STEP BY STEP

Mill your malts but leave rye flakes whole. Strike-in with approximately 3.5 gallons (13.25 L) of water to achieve a single infusion mash rest at 152 °F (67 °C). A softer water profile works well, but adjust your water as needed and aim at mash pH around 5.3 for best results. It's OK to mash a little thinner than this if desired, especially with the rye flakes and rice hulls if you choose to use them. Mash for 60 minutes or until converted. Vorlauf until clear and then begin transfer into brew kettle.

With kettle full, take a pre-boil gravity reading. Boil for 60 minutes. It's OK to boil longer if you want more color and flavor development, if you prefer to concentrate your wort, or want to ensure elimination of potential DMS (dimethyl sulfide) from the Pilsner malt. Add bittering hops at the 60-minute mark. With 20 minutes left add crushed juniper berries. Keep them in a bag to make removal easier. Add remaining hops at 10 minutes and at flameout.

Chill wort to 62 °F (16 °C) and transfer to your sanitized fermenter. Oxygenate at a moderate rate if using liquid yeast strain, then pitch

the yeast. Ferment at 62 °F (16 °C). Primary fermentation can take 5–12 days depending on several variables. The key is to be patient. The beer should finish around 1.010–1.011. Rack to secondary if desired or let sit for about one week after primary fermentation is complete then proceed to keg or bottle condition. Carbonate the beer to 2.6 volumes of CO<sub>2</sub>.

## CASTLE DANGER BREWERY'S NORDIC SAHTI CLONE

(5 gallons/19 L, partial mash)

OG = 1.053 FG = 1.011

IBU = 26 SRM = 7 ABV = 5.5%



### INGREDIENTS

3.75 lbs. (1.7 kg) Pilsen dried malt  
extract

1 lb. (454 g) Pilsner malt

1.25 lbs. (567 g) Briess caramel malt  
(10 °L)

1 lb. (454 g) flaked rye

0.75 lb. (340 g) honey malt

1.5 oz. (43 g) dried juniper berries,  
crushed (20 min.)

5 AAU Saaz hops (60 min.)

(2 oz./57 g at 2.5% alpha acids)

7.2 AAU Hallertau hops (10 min.)  
(1.5 oz./43 g at 4.8% alpha acids)

1 oz. (28 g) Fuggle hops (0 min.)

Wyeast 2112 (California Lager),  
White Labs WLP810 (San Fran-  
cisco Lager), or Mangrove Jack's  
M54 (California Lager) yeast

¾ cup corn sugar (if priming)

### STEP BY STEP

Flaked grains have no diastatic power, so they cannot self-convert, but they have fermentable sugars if converted. They need to be mashed with a base malt in order to be converted, so we will use 1 lb. (454 g) of Pilsner base malt to help convert the flaked rye and the honey malt. (The caramel malt is already pre-converted to sugar.) The rest of the base malt will come from dried malt extract.

Using about 2 gallons (7.57 L) of water, achieve a single infusion mash rest at 152 °F (67 °C). Insert the grains inside a mesh bag for easy removal later. Mash for 60 minutes

or until converted. Remove the grain bag, allowing the liquid to drain out. Raise wort temperature to near boiling, then remove pot from heat and slowly stir in about half of your extract until thoroughly dissolved. Holding back about half of the extract allows your hop extraction to better replicate that of the all-grain version. Return to heat source and raise to boil. Boil for 60 minutes.


Add bittering hops at the beginning of the boil. With 20 minutes left add crushed juniper berries. Keep them in a hop bag to make removal easier. Add remaining hops at 10 minutes and at flameout. Add remaining extract with about five minutes remaining in the boil to properly dissolve the sugars and sanitize the extracts.

Pre-boil and chill about 3.5 gallons (9.5 L) of water separately so you can add that to the wort later. Best to do this before your brew to make life easier.

Follow the all-grain recipe's step-by-step for remaining fermentation and packaging instructions.

### TIPS FOR SUCCESS:

If you are looking to brew a more historical version of the style, consider using a hefeweizen yeast strain that will provide the signature banana and clove character. If you want to replicate Castle Danger's Nordic as closely as possible, then employ a California common yeast.

According to Brewmaster Bjorn Erickson, "The fun thing about this kind of brew is you can feel free to change things up without being untrue to the style. If you are feeling bold, try using more rye, or add some Weyermann Cararye® for more color and depth to the rye flavor. Your mileage will vary with the juniper berries, especially depending on how much you can crush them and what state they are in. 'Dry hopping' with juniper berries can add more of the piney/menthol notes. An ounce or two (30–60 g) of lemon zest or caraway seeds can also punch up the aroma." Don't be afraid to play around with this one! 

## CRAFTING OAK-AGED HARD CIDER

### Take your cider to the next level

*Aging hard cider in oak barrels or on oak alternatives adds flavors, aromas, and unique complexities otherwise unobtainable in cider. If that oak previously held another spirit or wine (or was soaked in it, in terms of an oak alternative), the impact these products impart is even greater. Get in on the fun with the advice from two pros with massive barrel programs and years of experience.*

When seeking fresh oak character we often utilize oak chips instead of new barrels.



*Rick Hastings is Founder, Co-Owner, and Head Cidermaker at Liberty Ciderworks in Spokane, Washington. His ciders focus on traditional cider apples and methods, taking a "natural wine" approach using native yeast for fermentation. A 2010 graduate of the Peter Mitchell Cider & Perry Academy, Rick's ciders have won national and international acclaim, including three 2021 Good Food™ Awards.*

**B**efore you begin, it's important to identify what you're looking to achieve with oak aging.

That, plus the characteristics of the cider in question, should guide your decision-making. At Liberty, we barrel-age for three main reasons, often with some overlap:

- 1) To introduce flavors from used spirit barrels.
- 2) To introduce oak notes and tannins.
- 3) To bulk age, allowing the cider to develop and mature with the type of micro-oxygenation afforded by oak barrels.

As a rule of thumb, nearly any type of cider can work when the objective is about marrying flavors – assuming the flavors are complementary, of course. But we generally steer clear of trying to bulk age modern-style ciders in oak, reserving that for ciders featuring our cider-specific varietals. In short, dessert apples are generally best for ciders intended to be packaged and drunk fresh, while ciders with lots of tannic structure are the best candidates for oak aging.

We've had great success with wheat whiskey barrels from our local producer, Dry Fly Distillery. These are American oak, with a heavy #3-char. We've also had good results with gin and Bourbon barrels from Dry Fly, the former especially with lighter-bodied ciders. For our spirits-influenced products, we usually get just one cycle per barrel. After that, we re-use them as "neutral" barrels for long-term aging.

When seeking fresh oak character

we often utilize oak chips instead of new barrels. This provides more control than we'd get otherwise, both in terms of the type of oak and the degree of flavors developed. For such ciders, I'm partial to the vanilla notes typical of French oak. In fact, we use chips for one of our main-line products. When using them, chips are simply measured by weight, packaged loosely in mesh bags, and placed into our bulk aging tanks.

The time we leave the cider in a barrel depends on a few factors. For our whiskey-influenced line, three or four months is usually sufficient. For ciders needing other benefits, i.e., micro-oxygenation and/or malolactic fermentation, figure at least six months, keeping things topped off at all times, of course. Nearly all of our barrels are 55-gallon (200-L), so the timing may be different for smaller barrels homebrewers are more accustomed to.

For us, barrels are best for aging, as we usually try to avoid the mess and hassles of barrel fermentation. Since we generally prefer not to age ciders on gross lees, we prefer to ferment in HDPE or stainless steel, transferring to barrels when we're ready to age.

Depending on your objectives and type of apples used, give chips or other barrel-alternatives a hard look. The benefits of barrel-aging are often easy to emulate, giving you the chance to experiment and learn before making the heavier investment involved with physical barrels.





*Seth Boeve is the Head Cidermaker at Virtue Cider in Fennville, Michigan. Under his direction for almost nine years Virtue Cider has amassed more than 40 medals for its ciders. He loves being able to take an idea or concept from start to finish and sourcing the local fruit to create something beautiful to share with people.*

**A** lot of what you have to consider when deciding whether to oak age a cider or not is dependent on your intent with the cider you're making and what fruit you're starting with. Oak adds a lot of depth and complexity to the flavor but also needs to be balanced. Here at Virtue Cider, we oak age almost everything we make but, as I said, that is an expression of our intent with our ciders. For example, with our Brut Cider, a percentage of it is aged in oak to add more complexity to the nice dry Michigan apple cider and help round off some of the intensity.

We predominantly use French oak for aging our Core Series of ciders, all of which previously held wine. A lot of them are Chardonnay barrels, which help balance out some of the higher acids you get from the fruit. Based on our experiences, we get more vanilla-type characteristics in the French oak, although we have also used some American oak Bourbon-aged barrels for some of our ciders, like The Mitten (which is a blend of last season's pressed apples, aged in Bourbon barrels for up to one year, then backsweetened with this year's fresh pressed apple juice).

We keep our French oak barrels for as long as we can. We even have some from when we opened the cider house eight years ago. New barrels have more aggressive oak character to add to the cider, but with older barrels they help in other ways as they soften. With spirit barrels we only use them to age once or twice. You really get the character of the spirit with first use and then the character of the barrel in the second use. Then we can blend from there to find the right balance.

How long to age cider in a barrel is dependent on the size of the barrel and the amount of influence you want. You'll get more character and exposure on smaller barrels, which can also make the process go faster. Here at Virtue, we usually leave them for three months to a year.

We have not released any ciders at Virtue using oak alternatives yet, but we have done research into these products, and see a lot of potential.

There are tons of oak alternatives that give lots of good oak character. My biggest suggestion for homebrewers would be to do your research and talk to your homebrew shop or oak alternative vendor.

We predominantly conduct our aging post-fermentation. We choose that route due to the consistency in results. You know what you have going in and you have a pretty good idea of what will then come out of the barrel at the end. Fermenting in the barrel is an option, but it is less predictable since the barrel itself is its own environment. However, fermenting in the barrel definitely can have its own upsides too as it does add more depth to cider. We'll probably try out more in the future, but it takes you along for a bit more of an unexpected ride.

Oak aging is one of the most exciting aspects of the cider we make here. Some of the best ciders we make come out of oak as it complements the fruit so well. It's a little more effort, risk, and requires a little more education on the cidermaker's part, but I think it is totally worth it! I'd definitely recommend trying it out for yourself! **BYO**

#### **RELATED LINKS:**

- As mentioned, there are many exciting oak alternative products available to homebrewers. Learn more about the most popular — including liquid flavorings, powders, chips, cubes, spheres, spirals, and staves — in “Beyond the Barrel” at: <https://byo.com/article/beyond-the-barrel/>
- When many people think of barrels, they think of *Brettanomyces*. Get advice on making your own *Brett* cider from two pros at: <https://byo.com/article/brett-cider/>
- Oak aging cider is one way for homebrewers to apply brewing techniques to their homemade ciders, but there are many others worth exploring including flavor additions and fermenting with different beer yeasts. Learn more in “Cider for Beer Lovers” at: <https://byo.com/article/cider-for-beer-lovers/>



## KEYS TO GREAT WEIZEN

Also: Using fresh-picked hops, aging beer, and beer burps

The fun thing about weizen brewing is that there are several weizen strains that a brewer can choose from and their flavor profiles are diverse.

**Q** I LOVE HEFEWEIZEN, ESPECIALLY FRANZISKANER, BUT WHEN I BREW THESE AT HOME I NEVER GET THE AROMA THAT I AM SEEKING. I HAVE USED SEVERAL DIFFERENT TYPES OF MALT AND CHANGED UP MY MASH SCHEDULE TO INCLUDE A LOW TEMPERATURE REST, BUT I'M STILL NOT HAPPY WITH THE RESULTS. I'VE BEEN USING YEAST STRAINS THAT ARE SUPPOSED TO BE WEIHENSTEPHAN 3068. WHAT GIVES?

BRENDAN LAYDEN  
MEDFORD, NEW YORK

**A** I also love hefeweizens and enjoy brewing and drinking weizen beers! Weizen is definitely a yeast-driven style, where fermentation products really define the flavor profile. Let's set yeast aside for a moment and touch on a few other components of this wonderful style. A great weizen should have a creamy, stable foam, a slightly chewy mouth-feel, above average carbonation, little hop aroma or bitterness, stellar drinkability, and weizen character.

It does not sound like your issue is hitting the right malt profile, although you have unsuccessfully experimented with different malts and different mash schedules. That assumption is based on your displeasure with your beer aroma, and that is a yeast thing with weizen. A great starting point for a solid weizen is 50% Pilsner malt and 50% wheat malt. I like a very small dose, about 2%, of dark crystal malt for a dash of color and an ever-so-subtle touch of crystal malt flavor. Starting the mash around 104 °F (40 °C) also helps with this style because wort ferulic acid is boosted at cooler mash temperatures; this is especially important if you want clove in your aroma profile as ferulic acid is converted to 4-vinyl-guaiacol by weizen yeast (some strains more than others). Some brewers use decoction

mashing to increase mash temperature, but step mashing is most common these days and works well for the style. With well-modified malts a two-step mash with a mash-off step does the trick. Something like 20 minutes at 104 °F (40 °C), followed by a heating step to 153 °F (67 °C) for a 30–45 minute rest, then mash off at 167 °F (76 °C) is a solid mash profile.

Intensive mashing tends towards highly fermentable wort, especially with highly enzymatic malts, but weizen yeast often leave a bit of malt sweetness and a full body. That's part of the profile I personally like. When this is coupled with a high carbon dioxide level, a bit of yeast from the bottom of the bottle, and served in a clean weizen glass, the sensory experience is hard to beat for those who love this style. If you are starting in the 12.0 to 12.5 °Plato (1.048 to 1.050 SG) range, a beer with about 3 °Plato (1.012 SG) in the finish is typical.

For me, I know what I like in my weizen. And that is a balance of yeast aromas that favors 4-vinyl-guaiacol and de-emphasizes banana (isoamyl acetate). The fun thing about weizen brewing is that there are several weizen strains that a brewer can choose from and their flavor profiles are diverse. Weihenstephan weizen yeast and beers



Photo by Charles A. Parker/Images Plus

Weizen beers are often very simple recipes yet, for so many brewers, a hard style to perfect.



brewed from it have never been my favorites. Although I like them, they are a bit too banana-focused for my preference.

Style and recipe tips are topics I usually avoid, but this question is about my favorite style. Here are a few things to try:

- Check out WLP380 (Hefeweizen IV Ale) from White Labs (commercial brewers can check out BSI380 too). This yeast gives a great balance of banana and clove, leaves a nice touch of malt and body, is a true top-cropper, and produces classic Bavarian-style weizen.

**Q** I'D LIKE TO ASK YOU ABOUT POST-BOIL USE OF FRESH HOPS. I PLAN TO BREW A HARVEST BEER FROM MY BACKYARD CHINOOK AND CASCADE THIS YEAR. USING A GENERAL 5-TO-1 RATIO OF FRESH TO DRIED HOPS, DO YOU THINK I CAN OBTAIN THE SAME FLAVOR/AROMA BENEFIT FROM FRESH-PICKED HOPS IN THE WHIRLPOOL THAT I WOULD GET FROM DRIED HOPS? I'M THINKING OF ADDING THEM AT 170 °F (77 °C).

BILL MCMICHAEL  
NEW CASTLE, DELAWARE

**A** Thanks for the fun question! This topic is a great reminder that beer has been brewed way longer than our scientific understanding of raw materials, brewing, and beer. It wasn't long ago that landrace hops, or hop types indigenous to an area, were the norm. In these days, brewers knew very little about the brewing value of hops outside of where the hops were grown and the sensory attributes of the hops being tossed into the kettle or cask. Examples of landrace hops are Saazer, Hallertauer, Tettnanger, Spalter, and East Kent Golding. Brewers generously hopped beers with these regional hop types with no knowledge of hop chemistry until the early part of the 20th century. Yeah, less than 100 years ago.

OK, onto some practical thoughts. Your ratio of 5:1 for wet hops to dried hops is right in line with dry weight comparisons between the two types. Although hop drying does not result in appreciable losses of bittering acids or aromatics, both present in intact lupulin glands of whole hops, wet hops do have much more green and grassy flavors than their dried sisters. That's neither a good nor bad thing, just a difference.

Wet hops also contain enzymes that can, and often do, create fun and interesting flavor changes in beer when added to the fermenter. Until recently, enzymatic activity in beer from hop enzymes had been lost to history. The wakeup call was due to the insane amount of dry hops that some of today's craft brewers began adding to IPAs. Folks started noticing hop creep, wondered what the cause was, began doing research, and digging through the brewing literature. Like so much of history, the past hit the replay button. I'll bring this back to the discussion in a moment.

To directly answer your question, I am gonna say "no." Adding wet hops (fresh and unkilned) to your whirlpool will not give the same flavor and aroma as you would get from using kilned hops. In my mind, that's a big plus because it differentiates these beers from beers brewed with a different hop product. Would it not be boring if

- Pitch a touch on the low side and keep the fermentation temperature around 66 °F (19 °C).
- If you don't use a ferulic acid rest, change your mash profile to include one.
- Aim for 10–15 IBUs and use German hop varieties to minimize any aggressive hop aromas.
- If your goal is to mimic Franziskaner, use German malt.
- Shoot for about 3.0–3.5 volumes of carbonation, preferably in a bottle to make pouring easier and to get a little yeast in the mix.

using a different raw material had no noticeable effect on your beer?

Today's brewers want to be able to calculate stuff. Why? Because there is so much available data just waiting to be popped into the number machine. But the calculator is hard to use when brewing with homegrown hops because the alpha content is rarely known. That's cool; just use your homegrown hops for aroma. I like the idea of adding these wet hops to 170 °F (77 °C) wort because this temperature is hot enough to denature hop enzymes, but not so hot to isomerize alpha acids. What that means to the practical brewer is that you get aroma, hop flavor, little appreciable bitterness, and don't need to worry about hop enzymes, specifically amyloglucosidase, that can change wort fermentability.

Some brewers may be thinking that those hop enzymes sound like a fun journey. And that's where the diversity in brewing jumps into the mix. Another way to use your wet hops would be to dry hop with them. If you decided to go this route, consider limiting the contact time with beer because those green and grassy notes can be a bit extreme. A quick dry hop followed by racking off the dry hops or simply pulling the dry hop bag if a bag is used, will allow enough contact time with beer to extract hop aromas and enzymes, but gives the brewer a way of tempering the possibility of teasing out too much of the green flavors.

For anyone who decides to dry hop with fresh hops, this enzyme topic is more than academic. Hop enzymes convert unfermentable dextrins in beer into fermentable sugars, mainly glucose. If this happens in the package, the results can be volcanic. It also can cause a spike in diacetyl that may not fall below the sensory threshold if viable yeast concentration is too low. The takeaway is, if you plan on dry hopping a beer with wet hops plan for hop creep and allow things to happen before packaging.

Thanks again for the great question and have fun playing with your homegrown Cascade and Chinook hops!



## HELP ME, MR. WIZARD

**Q** HOW LONG WILL MY HOMEBREWED BEERS LAST? ARE THEY LIKE WINE AND GET BETTER WITH AGE OR DO THEY EXPIRE?

BOB BUNGARD  
MOSGIEL, NEW ZEALAND

**A** Hey Bob, before I attempt to answer this question I just want to let you in on a secret. If I could really answer this question, I would be retired on an island somewhere with few people but great access to brewing supplies. And not to spoil the ending; I don't have a clue! But that never stopped a blowhard from writing.

This question can be viewed from several angles. Let's start from a commercial perspective and assume you are bottling fully aged and carbonated beer. This sort of beer is not bottle conditioned, and should taste and appear about the same whether it is bottled, kegged, or canned. The rule of thumb with this sort of beer is that age does zero to improve beer. It's all downhill after packaging because these beers are at their peak when packaged, oxygen pick-up is impossible to prevent and these styles are not done any favors by oxidation. I will never forget a crude story told by a brewer from a large brewery when I was young and impressionable; this brewer stated that the brewing department did everything in their power to brew the best beer before releasing it to the packaging department, where the beer was fussed up to varying degrees when bottled.

Let's look at another commercial example with bottle-conditioned and cask-conditioned beers. These beers are most certainly not at their prime when packaged because the brewing process has not yet been completed. These beers come into condition in the package and morph during storage. Because these brews contain viable yeast, well-packaged beers are less likely to show the signs of oxidation caused by oxygen pick up during packaging. This argument has been over-played by many brewers who falsely believe that viable yeast prevents package oxidation. Oxidative reactions occur quickly and it is often the case where beer is oxidized before viable yeast can provide much help. That aside, bottle-conditioned beers are oftentimes more stable than their non-conditioned cousins.

This is where things become a bit more interesting and wine-like. Take a bottle-conditioned IPA as an example. This type of beer will come into condition, i.e., carbonate and flavor mature, yeast will begin to die and release enzymes, hop aroma compounds wane, especially if the beer had high package oxygen when bottled, and the beer slowly fades. Although

bottle-conditioned IPAs can be great beers many months after packaging, the hop aromas will give way to a malt-centric balance. Most beer judges don't love this sort of transition. Using your wine comparison, consider this analogous to a bottle of Pinot Grigio past its prime.

Other bottle-conditioned beers are much more resilient to age and some styles do indeed improve with age. These beers are usually higher alcohol beers with complex flavor profiles. Barleywines, barrel-aged beers, strong stouts, and big Scottish ales are examples of these brews. During aging, some alcohols slowly react with organic acids to form esters and some alcohols oxidize into aldehydes. These flavor compounds can add complexity to big beers that have enough umph to support the changes. Yeast autolysis, although usually a negative attribute in normal strength beers, can add desirable aromas to this sort of beer. But all good things come to an end; while maturation can be a slowly evolving process, aged beer, just like wine, can go from excellent to subpar in a flash. With that said, great beers usually don't last long enough in the cellar once they hit that perfect pitch to ever hit the downhill slide.

The last sort of beer I will mention are funky beers. You really never know what's going to happen with funky beer unless the beer is something routinely brewed with a known progression during aging. Some funky brews contain bacteria, some contain yeast, and others contain a mélange of bugs. *Pediococci*, *Lactobacilli*, *Brettanomyces*, odd *Saccharomyces*, *Acetobacter*, and even some enteric bacteria can be part of the wild beer roller coaster. Although many of these microbes come and go before packaging, there are often phases within the package where beer flavor may improve, followed by a downturn in flavor, that may or may not be permanently bad. These can be odd brews to age because one is never quite sure of the optimal time to enjoy.

The one thing I can state with certainty is that most beers that taste bad today will probably taste bad tomorrow. If you have a batch that seems off and you hold on to it for periodic tasting, don't hang on to it forever hoping it will improve. Most beers taste better today than they will tomorrow, so when you brew a great batch of homebrew enjoy it and get busy brewing a replacement!

**Q** HAVE YOU EVER HEARD OF USING A BURP TO HELP EVALUATE BEER? I'VE NEVER HEARD OF IT BEFORE, BUT I FIND THERE ARE ALL KINDS OF INTERESTING CHARACTERISTICS THAT CAN BE FOUND IF MY NASAL CAVITY GETS A SECOND PASS AT THE BEER AROMAS ... MOST NOTABLY IN BIG, HOPPY IPAS, THIS IS MY BEST TOOL TO ASSESS DIACETYL LURKING BELOW ALL THE HOP OILS. NOT LIKE I'M PURPOSEFULLY DOING THIS WITH EVERY BEER ... IT'S JUST WHEN IT OCCURS SPONTANEOUSLY. BUT I'VE BEEN DOING THIS FOR YEARS TO FIND HIDDEN CHARACTERISTICS AND FLAWS IN BEER. JUST ME?

NOELLE GREEN  
DANBY, VERMONT



**A** This just goes to show that learning never stops. I can state with conviction that I have never heard or read about this method in decent circles. But I am choosing to tackle this odd sensory evaluation technique because I have noted myself doing this and even discussing with close friends, usually after too many samples of beer have been evaluated. The old hop belch certainly has its own sensory experience.

There are definitely problems with the method. The first is that the sample is not always coming from the cleanest sensory vessel. That occasional diacetyl bump you are detecting could come from the beer, but it can also be coming from that cheddar cheese chilling out in your paunch. In my experience, I have found the cleanest eructations emanate from an empty belly.


Yeah, this is kind of a gross topic, but it's also interesting. Think about that pint of IPA just hanging out in the internal bota bag waiting to be absorbed. What's going on down there? For starters, the dissolved carbon dioxide in that beer is going to come out of solution as the beer is warmed. This begins to fill your stomach up with gas. Think about it; the typical half liter (16.9 oz.) of beer contains the equivalent of about 1.25 L (42 oz.) of gas, and the typical human stomach can expand to about 1 L (34 oz.). This means that your belly balloon is probably full and that gas is going to go somewhere.

Besides degassing, that hoppy IPA is down in your body's own barrel warming up and concentrating beer volatiles in

the headspace. Ever cover a beer glass while swirling to increase aroma intensity? If not, give it try... or just pay attention to those beer burps because that's what often naturally follows a beer or two. The interesting thing about this gas encounter of the best kind is the aroma concentration that can occur down there in a clean incubating chamber. It's like 1, 2, 3, hop eruption! The trained judge will have the mind's chalkboard cleaned for optimal note taking. Burrrrr! Piney, grapefruit peel, linalool, rose water, and pineapple. Darn, I cannot remember those secondary notes. Burrrrrr! Coconut, caramel, and, there it is, diacetyl!

I do have a few serious tidbits of advice about this method. Repeating an earlier point, this works best on a clean stomach. I am not implying that any extreme measures are needed, but you don't want to be doing this after eating spicy foods because, not to ruin it for you, your beer probably does not really have a cumin and garlic aroma... that's dinner! OK, so you need to do this on a clean stomach.

Second pointer is pretty obvious. Do not, I repeat do not use this method in public. And if you do, don't even think about announcing to the room that you are a hopeless beer geek because that just ruins the reputation of all us respectable, hopeless, beer geeks. No, doing this in public is just plain rude. And it's equally verboten at a judging table. Seriously, you can lose your brewer's permit.

Finally, and this one is really, really important. Never, ever admit using this method for any other purpose than pure entertainment. No one wants to hear about your burp-o-meter. 



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## SAHTI

### A traditional Finnish farmhouse ale

Much of the history is based on folklore tradition, so calling it a “Viking Age beer” is not inaccurate.

**B**eer writer Michael Jackson helped introduce sahti to the world through his books and articles, but the beer has a very long tradition – so much so that he called it the “only primitive beer to survive in Western Europe.” Recent interest in traditional Scandinavian brewing has further stoked the interest of brewers, as has general interest in farmhouse beers. Yet since examples are difficult to find, many craft beer drinkers have only a passing understanding of the style. Sahti is most commonly associated with two signature ingredients: Juniper and rye.

One point of confusion among many craft beer drinkers is when something is called a farmhouse beer. Too many people seem to think this means spontaneous fermentation and a barnyard character, but neither of those are correct. It simply means that the beer was traditionally made by farmers at the farm using materials at hand, like the grain they grew and sometimes malted. Like turning milk into butter, farmers turned grain into beer for their own use. Gradually, industrialization replaced this tradition of farmhouse beers, but sahti is one of the few remaining instances of this type of beer production.

This style was introduced to the Beer Judge Certification Program (BJCP) style guidelines in 2015 under category 27, Historical Beer. If there ever was a historical beer to include, this is it. I was only able to put together a style description for this beer at the time because of writings Garrett Oliver had done that included sufficient sensory details to make judging possible. Since then, several books and articles by Finns such as Mika Laitinen have both confirmed and expanded on this starting point.

#### HISTORY

There are many kinds of farmhouse beers in Scandinavia and Baltic countries, as well described in the excellent book *Historical Brewing Techniques* by Lars Marius Garshol. Sahti is only one of them, but it has some fairly unique characteristics and production methods. Just don't think that because we are focused on sahti that other countries in the region don't have a similar tradition – they do, but they all have their own unique methods and ingredients.

While sahti is from Finland, current production seems to be most concentrated in southwest Finland. The brewing tradition is ancient, since before the Middle Ages, certainly before modern brewing was understood. Much of the history is based on folklore tradition, so calling it a “Viking Age beer” is not inaccurate. The excellent paper *Physiochemical Characterization of Sahti* from the Institute of Brewing and Distilling (IBD) mentions that sahti was first described in detail in 1780, and was ancient then. Despite the lack of historical evidence, there is currently a surprising agreement on the basic outlines of the style.

The farmhouse brewing tradition followed the development of agriculture, so even in the post-Ice Age world in Nordic countries, this would be ancient – at least to the first millennium C.E. Advancements were introduced, of course, but primitive conditions and remote locations would certainly constrain the pace of change. The style predates the use of hops in beer, but juniper serves a similar role. Home malting died out by the 1960s, so commercial malts are now used. House yeast was also largely replaced by commercial baker's yeast in the 20th century.

#### SAHTI BY THE NUMBERS

OG: .....	1.076–1.120
FG: .....	1.016–1.038
SRM: .....	4–22
IBU: .....	0–15
ABV: .....	7–11%



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Sahti is a strong beer, so it is considered a beer for special occasions like weddings, feasts, and seasonal celebrations. Commercial breweries have made this in Finland since the 1980s, but it is historically a homebrew from the farm. Traditionally produced using farm equipment, commercial breweries still try to use the historical procedures to make this type of beer while employing their current equipment.

## SENSORY PROFILE

There is enormous variation in the beer from brewer to brewer, so the sensory profile also has to be somewhat broad. While the European Union (EU) created a definition as part of making it a protected appellation, the requirements are equally broad. The EU describes it as an unpasteurized, unfiltered beer of 19 °P (1.079 SG) or more original gravity, 6–12% ABV, pH less than 5, using baker's not brewer's yeast, having a slightly sweet taste, and being a yellow to dark-brown color.

The IBD scientific article provides some good insight into the sensory profile of the beer since they analyzed many examples. They describe it as a strong and sweet beer, with a high original gravity and a high finishing gravity. The beer has a fruity or floral yeast profile from fermentation, and 4-vinyl guaiacol (4VG, or clove flavor) is above the flavor sensory threshold. The beer is turbid, orange-red in color, and has no foam. Carbonation is low, but not completely still. Bitterness was measured at about 9 IBUs on average. The pH on average was 4.4, so it is similar to common beer. But the high residual gravity shows there are a lot of unfermented sugars present. The beer is unusually thick and viscous due to the lack of a boil and the use of rye.

Other references mention the juniper character as green and fresh, foresty, woody, pine-like, with some citrus notes, possibly moss-like and mineral. Michael Jackson called it minty, but that is not a descriptor used elsewhere. The juniper gives a smooth and rounded bitterness, since the hop bitterness is below sensory threshold

## SAHTI

(5 gallons/19 L, all-grain)  
OG = 1.099 FG = 1.038  
IBU = 9 SRM = 16  
ABV = 9%



## INGREDIENTS

15.5 lbs. (7 kg) Pilsner malt  
2 lbs. (0.91 kg) dark Munich malt  
2 lbs. (0.91 kg) rye malt  
1.25 lbs. (567 g) caramel rye malt (65 °L)  
1 lb. (454 g) rice hulls  
4 AAU Spalt hops (mash hop) (1 oz./28 g at 4% alpha acids)  
1–2 small *Juniperus communis* branches to cover the mash tun  
LalBrew Munich Classic, SafAle WB-06, or a favorite kveik yeast of your choice.

## STEP BY STEP

This recipe uses reverse osmosis (RO) water. Adjust all brewing water to a pH of 5.5 using phosphoric acid. Add 1 tsp. of calcium chloride at the beginning of the mash.

This recipe uses a long, multi-step infusion mash, but no boil. The wort is not concentrated by boiling so think of this as a first-runnings beer. Mash in the grains with the rice hulls at 113 °F (45 °C) using 1.2 qts./lb. (2.5 L/kg) of water. Add the hops then hold for 30 minutes. Raise the temperature to 122 °F (50 °C) and hold for 30 minutes. Raise the temperature to 131 °F (55 °C) and hold for 30 minutes. Raise the temperature to 140 °F (60 °C) and hold for 30 minutes. Raise the temperature to 149 °F (65 °C) and hold for 30 minutes. Raise the temperature to 158 °F (70 °C) and hold for 30 minutes. Add the juniper to the mash. Raise the temperature to 167 °F (75 °C) and hold for 30 minutes. Raise the temperature to 185 °F (85 °C) and hold for 30 minutes.

Run off the wort slowly into the fermenter until you have collected 5 gallons (19 L). You may need to sparge lightly if necessary to reach this volume. Brew-in-a-bag

users may have an advantage since they can wring out the wort from the grains as well. Using a larger fermenter is advisable since the fermentation can be vigorous.

Chill to 50 °F (10 °C) and pitch the yeast. Allow the temperature to rise to room temperature as the fermentation gets going. When fermentation starts to slow, rack the beer gently to secondary and move to a colder location, 50 °F (10 °C) or below. Condition for one week. Try to avoid removing carbonation from the beer during transfers.

Keg without additional carbonation, or package in plastic soda bottles. Do not prime. Since the beer is biologically unstable, you will want to store below 40 °F (5 °C) and preferably consume within two weeks.

An extract recipe is not possible due to the unusual brewing technique of sahti and the fact that much of the character of the beer comes from the wort production.

## TIPS FOR SUCCESS:

While sahti is beer produced from the first runnings from the *kuurna*, or lauter tun, the remaining sugars would not be wasted. Traditionally a second runnings beer would be fermented to produce a table beer or "ladies sahti." If you have the fermentation space, it seems prudent to collect these sugars and make one yourself as there will be plenty of sugars remaining in the mash.

If you cannot source fresh, green juniper branches, then you can substitute in juniper berries as well, which will provide more of a black-pepper kick compared to the pine needle-like branches. According to Mika Laitinen, adding 0.18 oz. (5 g) berries per 5 gallons (19 L) of beer directly to the fermenter (like dry hops) is a good starting point. He also adds that: "A fine sahti can be made without any juniper and it is often perceived in sahti even when not actually used, the baker's yeast can give a similar spicy twist."



## STYLE PROFILE

and there is no hop flavor or aroma. The flavor is more of juniper branches than its berries; the well-known component of gin's character. Other spices were probably used in the past, but those have been lost to time.

Malt flavors include worty sweetness, some caramel and toffee flavors, maybe some nuttiness. Rye can contribute some graininess and add a touch of dryness, maybe a light spiciness. There should not be roast, burnt, or smoky flavors. Yeast flavors are fruity, and banana-like, with some spicy phenols.

The mouthfeel deserves some discussion. Some have said the beer is thick, like a milkshake. I would say full body and high viscosity. The carbonation is natural, and low like in a British cask ale. The alcohol strength is significant, but in a low bitterness, sweet beer, it may be covered up. Alcohol can be warming, but the beer should not seem boozy. The beer should not be sour or acidic; Finns consider sourness a fault, and a sign the beer is too old. Michael Jackson described sahti as smooth, soft, and drinkable on the palate.

The color of the beer can vary wildly, from yellow to dark brown. Reddish-amber colors were often mentioned as being desirable. With low carbonation, the beer should not have any significant foam. The high final gravity, high protein content, and poorly flocculating yeast make the beer hazy and turbid.



Photo by Mika Laitinen

*In the old times, straw and juniper twigs were laid on the bottom of the kuurna (equivalent to a lauter tun) to act as a false bottom for sahti production. The mash would be scooped into the vessel after several hours of mashing, often in the range of four to six hours.*

## BREWING INGREDIENTS AND METHODS

This beer can be difficult to produce, especially if authenticity is your goal. Most brewers will make reasonable substitutions to obtain a facsimile of the original, but even in Finland modern brewers produce the beer with current equipment yet using traditional procedures. I will try to talk about the range of options, so this section will be longer than in most of my articles.

Traditional grains used would be what was grown on the farm. Barley, of course, was used, but rye was also common. Oats and wheat could be used, but that is not common now. Grains are typically malted. In modern times, most Finns have switched to Viking Sahti malt, a proprietary commercial blend of at least three malts. Brewers there have suggested that a blend of Pilsner and Munich malts is an acceptable substitute (maybe 80–90% Pils malt, and 10–20% Munich malt). Rye is usually no more than 10% of the grist, and can be malted rye, dark rye, or even rye flour. Vienna malt appears in some recipes as well; it is certainly a solid choice here. Sugar adjuncts are never used.

There is a commercial dark rye malt in Finland, but this isn't exported. I would use something like Weyermann rye malt, and maybe add some other malts for more flavor. Some have suggested adding caramel rye malt, and this isn't a bad idea. I might try to bring in more flavor by using a bit of dark Munich malt, which is not traditional but is attempting to substitute some more developed flavors. Toasting commercial rye malt could be used as well, maybe toasting the malt at 350 °F (180 °C) in the oven until it turns a more golden-brown shade.

In traditional times, malt would have been dried at the farm and the malt would have had a smoky flavor, typically using alder or birch wood. However, modern examples using commercial malts do not have this character, and the beer is not considered to be a smoked beer so I would stay clear of adding yet another complex flavor to the mix. I mention this only because I have tasted some interpretations that are smoked and I wanted to point out that regional sources have said this is not a smoked beer.

As an ancient style, mashing was complicated and not based on scientific understanding but rather practical experience and what was possible using available equipment. A long mash, upwards of six hours, was common. It started very thick (perhaps around 1.2 qts./lb. or 2.5 L/kg) and was heated either through infusions or the additions of hot stones to the mash. The stones could add some caramelized flavors, but this is not a requirement of the style. I do think it helps justify the use of caramel rye malt, however. Decoction is another alternative, but I would avoid boiling the grain since it might make lautering difficult.

Mash rest temperatures were often not documented as scientific measurement instruments were not traditionally used. Modern practice seems to start in the protein rest range of around 122 °F (50 °C) although some can start as low as 86 °F (30 °C). Mashing continues until at least 158 °F (70 °C). Since the wort is not boiled, mashing may continue as high as 176–194 °F (80–90 °C). Bringing the mash



“Some have said the beer is thick, like a milkshake. I would say full body and high viscosity.”

to a true boil is not done since this makes lautering even more difficult than it is. But the high mash-out temperature is believed to improve the stability of this beer.

Lautering traditionally is done in a hollowed-out log using boughs of juniper as a filter. The shape of the lautering vessel is therefore long and narrow (see photo on page 26), which would help keep the mash from being too deep. Modern versions can be made in mash tuns using false bottoms, but often use juniper as well. As an alternative, juniper can be added to the mash tun or steeped in the strike water. The juniper must be fresh and green, and is often not too mature. Some have described the branches as having a diameter smaller than your finger. The branches may or may not have berries attached. The species of juniper is usually *Juniperus communis*, which is not common in the U.S. – be careful with substitutes since some juniper species are toxic.

I have used Colorado Blue spruce in other beers in a similar manner, and steeping the branches in the brewing liquor is an interesting idea. Steep the branches for two to three hours in 176–194 °F (80–90 °C) water, then strain. Don't boil the wood, since this will provide an unpleasant bitterness and astringency to the finished beer. Since the mash program goes through similar temperatures, just adding the branches to the mash can serve a similar purpose. Juniper berries have a different flavor than the branches and are not a substitute. Berries are optional, but can have a more aromatic quality.

At the farmhouse, brewers would reuse their yeast by top-cropping and often drying the yeast. Some used wooden chains to collect and store the yeast. It was certainly not spontaneously fermented. The use of Finnish baker's yeast is current practice; Suomen Hiiva is the brand. This yeast is different from North American baker's yeast. It is fruity and banana-like, is POF+ (phenolic off-flavor positive, so it has a clove flavor), is not a good flocculator, and may have a little lactic acid bacteria present. Sourness is not desirable in this style, so the beer has to be handled properly to avoid developing sour flavors.

Some have suggested using kveik yeast, since it is often of Norwegian origin. That could be interesting, but most kveik yeast are POF- so the flavors won't be the same. If you don't like clove flavor in your beer, kveik is a good choice and ferments fast. One such yeast was found to actually be a Bavarian weizen strain, so I think that makes a reasonable substitute to the Finnish baker's yeast. If you find a yeast that is fruity, has a banana flavor, produces some clove, and ferments fast, it should work. But if you described that type of yeast to me, I think I'd call it a weizen yeast. So outside the EU, I would try a dry German weizen or Belgian wheat yeast rather than something like Fleischmann's bread yeast or whatever is found at

your grocery store. I would also shy away from the classic Weihenstephan 3068-type yeast since it is so clearly associated with hefeweizen-type beers. Something with more fruit flavors than banana is OK.

Fermentation practice in Finland seems to be to start cold and then allow to warm. Since the wort is unboiled, this is probably another precaution against spoilage. Traditional farm yeast was used at warmer temperatures, but since baker's yeast has been used the temperatures are lower. Pitch below 50 °F (10 °C) and allow it to rise to room temperature as it begins to work. Fermentation is typically fast, often in less than three days. A cool secondary fermentation for up to a week is often used, and the beer is then stored cold (like you would for milk). It is often not stable, so should be consumed soon. Also the resulting beer is not primed, so whatever natural carbonation is present is acceptable.


Hops are often used in a symbolic form, almost like in lambics. Low alpha varieties can be added to the mash as a protection against spoilage, but they don't add detectable aroma, flavor, or bitterness. Brewers often don't measure them; you see recipes describe adding a couple handfuls of cone flowers to the mash. If you have any older, oxidized hops, here might be a place to use them. Since the wort is not boiled but the mash is very long, I think adding them to the mash is the correct procedure. The variety doesn't really matter, so I would probably select low-alpha, noble-type European hops like Saaz or maybe Spalt. Some versions are unhopped, but I think hopping is a good precaution.

None of the references I consulted mention anything about brewing water, so I would just use fresh, clean, low-mineral water. Tell yourself stories about it coming from a glacier, if you like.

### HOME BREW EXAMPLE

Not much additional to say here since I described the various options previously. I'll just put them into practice. The grist is Pilsner, dark Munich, CaraRye®, and rye malt, all Weyermann, and in the proportions common for the style. Some Spalt hops at about 9 IBUs gives me an average bitterness for the style. Since I'm using rye malt, I'll use some rice hulls to help with the laut.

I use a four-hour multi-step mash, recirculating and direct heating the mash on my system. The recipe calls for resting but it also can be made with a slowly increasing temperature throughout the mash, as long as the total mash time is the same. Don't dilute the mash too much since the wort will not be concentrated by boiling; think of this as a first runnings beer.

Dry weizen yeast will have to do since I can't get Finnish baker's yeast, and I'm using a cool ferment. I'm shooting for about a 9% beer. One day I hope to make it to Finland to see how close I got. 

# Holiday

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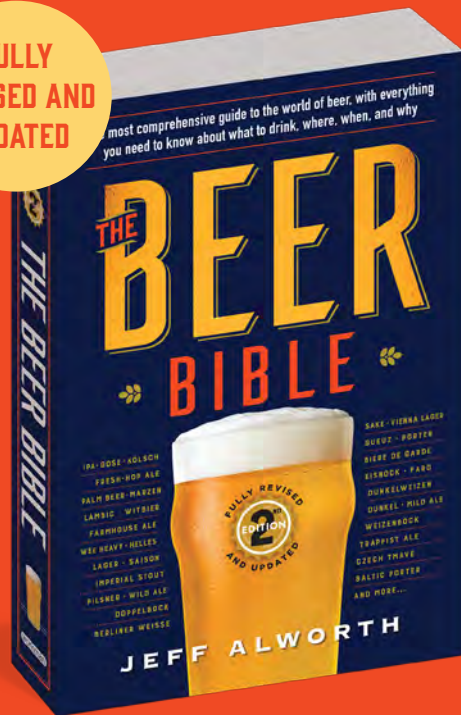
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WEDNESDAY, NOVEMBER 3, 2021



**INSIDER TOUR OF DENVER-AREA CRAFT BREWERIES** - You'll tour – and taste – at four different craft breweries in the Denver area during this pre-event optional offering. You'll have the opportunity to meet brewers and ask questions in addition to sampling their beers. Includes a beer-pairing meal. A great way to kick off your BYO Boot Camp experience and check out some of Denver's thriving craft beer scene.

THURSDAY, NOVEMBER 4, 2021 DENVER BOOT CAMPS

Each Boot Camp will run from 9:30 a.m. to 5 p.m. and is limited to just 35 people. Your Boot Camp will include lunch as well as a post-Boot Camp Colorado Beer Reception with local craft breweries pouring samples to wrap up your full day.



**TROUBLESHOOTING HOMEBREW FAULTS & FIXES** – *with Ashton Lewis* – Join *Brew Your Own's* Mr. Wizard and Technical Editor Ashton Lewis as he walks you through the potential minefield of beer flaws and faults homebrewers can face. You'll learn how to troubleshoot – and fix! – your own homebrews with Ashton who has helped thousands of homebrewers over the last 20+ years troubleshoot common and not-so-common beer problems as *BYO's* Mr. Wizard. You'll have a chance to experience many faults first-hand to better recognize them later. Plus as a special bonus, bring in your own troubled homebrews and Ashton will use your beer as a live example walking the class through the thought process as he figures out what might have gone wrong with your homebrew and what you can do to fix the problem moving forward.



**ALL-GRAIN BREWING ESSENTIALS** – *with John Palmer and John Blichmann* – Designed for intermediate to beginner homebrewers getting into all-grain brewing, this full-day workshop will cover all you need to know to successfully make great homebrews using all-grain brewing both with traditional and newer techniques. *How To Brew* author John Palmer and equipment guru John Blichmann will take you hands-on through the full all-grain process from milling, mashing, and sparging before going into the boil. You'll get to know the equipment, techniques, and ingredients first-hand and learn all-grain brewing by doing in a small-class environment. They'll also cover newer homebrew all-grain techniques such as Brew-in-a-Bag and No Sparge in addition to traditional mash methods and some advanced tips as well.



**RECIPE FORMULATION ESSENTIALS** – *with Brad Smith* – Learn the best ways to jump into creating your own signature recipes and understand the keys to developing a specific grain bill, hop schedule, and ingredient proportions to meet your homebrewing goals. Brad Smith, owner of Beersmith software and a *Brew Your Own* Contributing Writer, has helped thousands of homebrewers design their own beer recipes and now you'll learn first-hand from this recipe building expert how to use both artistic and scientific approaches to beer design to end up with the beer you had envisioned in your glass. You'll explore ingredients, techniques, and even your own brewing system during this practical boot camp that will get you on the right path to craft your own recipes for better beers at home. Please note Brad will also be offering an advanced recipe design workshop on Saturday as well.



**ADVANCED ALL-GRAIN TECHNIQUES** – *with Gordon Strong* – Pull out the mash tun and get ready to learn advanced all-grain techniques hands-on with *Brew Your Own* "Style Profile" Columnist, book author, and President of the Beer Judge Certification Program, Gordon Strong. Gordon will walk you through a world beyond straight infusion mashing with keys to mastering step mashing, sour mashing, and decoction mashing. Plus you'll learn about playing with mash thickness and other ways to control your all-grain wort production. Please note this workshop will also be offered on Saturday as well.



**ADVANCED YEAST TECHNIQUES** – *with Kara Taylor* – White Labs' Laboratory Operations Manager Kara Taylor as she discusses how to master different yeast-related techniques including harvesting yeast, figuring cell counts, the dos and don'ts of repitching including steps such as yeast washing, building up a proper yeast starter, storing your yeast samples, and much more. Here's your chance in a full-day seminar format to learn about getting the most from your yeast from one of the true leaders in the beer yeast field.



**ADVANCED HOMEBREW HOPPING TECHNIQUES** – *with Dave Green* – Join *Brew Your Own's* Dave Green as he explores when and how to add hops to create awesome hop-forward brews. You'll explore the basics of hop biology (and why it matters to us!); techniques and timing of hop usage including mash hopping, boil hopping, whirlpool/knockout hop stand additions, and dry hopping; hop varietal choice strategies including hop pairing/blending; evaluating hops including hands-on hop rubbing and sensory training; and practical usage techniques including hop extracts, boil-hops "management" (bags, filters, free addition), and water adjustments for hoppy beers. By the end of the full day Dave will make sure you are making informed hops decisions and getting the most out of your hops – and into your glass!

**FRIDAY, NOVEMBER 5, 2021  
BONUS BOOT CAMP SEMINARS  
9:15 A.M. TO 5 P.M.**

We are adding a third bonus day to our normal event schedule based on feedback we've received from past attendees who wished they had a chance to learn from all our assembled speakers beyond their Boot Camp workshops. So for 2021, we've scheduled a full day of seven different seminars led by our cast of brewing all stars who will share their knowledge with you on their area of expertise. It will be a full day packed with great tips and techniques from the best in the industry so get ready to learn. Plus you'll have even more time to check out the latest homebrew gear and ingredients with our Boot Camp sponsors located right in the meeting area.



**9:15 A.M. – 10 A.M.**  
Brad Smith on Recipe Design



**2:15 P.M. – 3 P.M.**  
John Blichmann on Layout Designs for Homebreweries



**10:15 A.M. – 11:30 A.M.**  
Ashton Lewis on Avoiding Brewing's 5 Biggest Mistakes



**3:15 P.M. – 4 P.M.**  
John Palmer on Brewing Water Demystified



**1:15 P.M. – 2 P.M.**  
Gordon Strong on Evaluating Homebrew Like a Beer Judge



**4:15 P.M. – 5 P.M.**  
Kara Taylor on Yeast and Fermentation Myths Busted



**TURNING PRO & COMMERCIAL BREWERY START-UP: THREE-DAY BOOT CAMP**

– with *Steve Parkes and Audra Gaiziunas* – By popular demand, we're expanding our past two-day Brewery Start-Up Boot Camp to three full days to better cover more material in more depth for you. When you register for this class you will attend it for Thursday, Friday, and Saturday unlike our other offerings.

Opening up a commercial brewery is a far cry from just ramping up the amount of beer you brew. Steve Parkes, who has trained hundreds of pro brewers as lead instructor and owner of the American Brewers Guild, will walk you through the steps, planning decisions, and keys you need to know if you want to open a successful commercial craft brewery. Learn from his decades of expertise and wide range of experience to help you better achieve your goals of turning pro. Plus for one full day you will learn brewery financials, keys to a good business plan, and other start-up money skills with craft beer numbers expert Audra Gaiziunas.



**SATURDAY, NOVEMBER 6, 2021 DENVER BOOT CAMPS**

Each Boot Camp will run from 9:30 a.m. to 5 p.m. and is limited to just 35 people. Your Boot Camp will include lunch as well as a post-Boot Camp Colorado Beer Reception with local craft breweries pouring samples to wrap up your full day.



**ADVANCED RECIPE FORMULATION** – *with Brad Smith* – Take your recipe creations to the next level by dialing in the specific grain bill, hop schedule, ingredient proportions, and water treatments to meet your brewing goals. Brad Smith, owner of Beersmith software and a *Brew Your Own* Contributing Writer, has helped thousands of homebrewers design their own beer recipes and now he’s ready to get in-depth on the details of beer design so you end up with the beer you had envisioned in your glass. You’ll explore ingredients, techniques, and understanding your own brewing system during this boot camp designed for advanced homebrewers that will help you craft your own recipes for better beers. This workshop can be taken in combination with Brad’s Recipe Formulation Essentials class on Thursday that offers more of an introduction to intermediate and beginning brewers to the concepts of writing your own recipes.



**ADVANCED YEAST LAB** – *with Kara Taylor* – Join White Labs’ Laboratory Operations Manager Kara Taylor for some hands-on yeast lab work to develop skills you can bring back home to help you make better beer. Learn how to accurately count yeast using a microscope, culturing yeast, using slants, harvesting yeast, washing and reusing yeast, propagation and determining growth rates, and more. Here’s your chance to learn hands-on what you may have read in books and magazines, or listened to in seminars, and Kara’s the perfect teacher to lead you through the world of yeast using lab equipment you can source for your home use.



**HANDS-ON HOMEBREW SCIENCE** – *with Ashton Lewis* – Get hands-on with pH meters, slants and loops, stir plates, centrifuges, and other brewing science gear with *BYO* Technical Editor and Mr. Wizard Columnist Ashton Lewis. Ashton will walk you through how to best use scientific gear at home to help you improve the quality of your beer. You will have the chance to understand not only how to use and care for the equipment properly, but also how to take the results and put that data into action to produce better beer in your glass. This workshop will focus only on those pieces of equipment suitable – and affordable – for your homebrewery.



**BREWING WATER ADJUSTMENTS** – *with John Palmer* – Water is the least understood ingredient when making great beer. John Palmer, who literally wrote the definitive book on the subject, *Water: A Comprehensive Guide for Brewers*, will help take the mystery out of water’s role in brewing and how to make better beer as a result. You’ll learn how to read water reports, understand flavor contributions, and how to adjust your brewing water to make different styles of beer. You’ll leave with not only an understanding of the chemistry concepts of brewing water, but also the practical how-to aspects of getting the most from this critical brewing ingredient.



**ADVANCED ALL-GRAIN TECHNIQUES** – *with Gordon Strong* – Pull out the mash tun and get ready to learn advanced all-grain techniques hands-on with *Brew Your Own* “Style Profile” Columnist, book author, and President of the Beer Judge Certification Program, Gordon Strong. Gordon will walk you through a world beyond straight infusion mashing with keys to mastering step mashing, sour mashing, and decoction mashing. Plus you’ll learn about playing with mash thickness and other ways to control your all-grain wort production. Note: This Saturday workshop is a repeat of the Thursday class and is offered twice due to its popularity.

**SUNDAY, NOVEMBER 7, 2021**



**INSIDER TOUR OF DENVER-AREA CRAFT BREWERIES**

You’ll tour – and taste – at four different craft breweries in the Denver area during this post-event extra offering. You’ll have the opportunity to meet brewers and ask questions in addition to sampling their beers. Includes a beer-pairing meal. A great way to wrap up your *BYO* Boot Camp experience and check out some of Denver’s thriving craft beer scene.

**We look forward to seeing you in person in Denver!  
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Full Event Details Available at:**

**[BYOBootCamp.com](http://BYOBootCamp.com)**



Photo by Jimmy Woods





# Better Together

HOMEBREW CLUB BARREL SHARES

by Luke Pernotto

**A**fter a year of pandemic brewing many of us are looking for new ways to explore our hobby. One way to get creative could be starting a homebrew barrel program. While local homebrew supply stores carry cubes, chips, spirals, and other “oak alternative” products for wood aging, these all seem to fall short of the romance of placing your home-crafted ales into a full-sized barrel. The Morris Area Society of Homebrewers (MASH) in New Jersey has two barrel projects for club members to enjoy the mystique of barrel aging their beers while defraying some of the prohibitive costs tied to the process that an individual would have to invest if they went it alone.

The cost of a used or new barrel can be just as much as a top-of-the-line kettle. While most barrels used for brewing are discarded Bourbon bar-

rels, there are also barrels for wine and other spirits available, some of which may be more common depending where you live. The increase in popularity of commercial barrel aging programs and whiskey production have steadily increased the cost of these once affordable barrels. Depending on the size and quality, the cost can run up to \$250 dollars and a barrel transfer tool (also called a bulldog) can run an additional \$250+ (no, a bulldog is not a necessity for barreled beers as siphoning through tubes will also work, but since our club purchased a bulldog I thought it worth mentioning). With the cost of a 5-gallon (19-L) grain bill and yeast running about \$25, multiplied to fill a barrel this equates to over \$250 dollars for the wort alone to fill a 53-gallon (200-L) barrel. Of course, this is quite a large amount of beer for an individual, and with the costs associated with these beers it generally

adds up to dissuade even those most interested in full-sized barrel aging.

Enter the MASH barrel share project, which makes the cost much more reasonable when it is spread across a group of club members. Using the barrel for consecutive fills diminishes the cost even more. One potential drawback is that with having several members contributing their fermented beers to the barrel there is an increased chance of introducing unwanted bacteria. This occurred in the club’s first barrel after the first fill. The second barrel has been kept “clean” by steaming between fills.

The first barrel our club got our hands on was previously used by Heaven Hill Distillery and procured from Keystone Barrel Supply in Montgomeryville, Pennsylvania. The second barrel was previously a wine barrel procured from Northeast Barrel Company in nearby Lansdale,



MASH homebrew club members Jimmy Woods, Shaun Ananko, Paul West, and Drew Rodgers (left to right) filling kegs from a club barrel.

Pennsylvania. These companies were used due to proximity to the club in northern New Jersey. Websites such as OakBarrel.com and Midwest Barrel Company have different selections of barrels, and there may be other used barrel distributors in your region. Your club's location and willingness to cover shipping will determine the best company to go through. Another great option is to buy it direct from a distillery, winery, or brewery that may be retiring a barrel. The key is to get a barrel that has been recently emptied. A barrel that has been empty for a while may leak due to the staves having dried and contracted and will need to be expanded before you add any beer to be aged. Also, the longer a barrel sits empty the higher the likelihood unwanted funk will grow in the barrel.

The club uses a barrel bulldog and a barrel steamer that is borrowed from Twin Elephant Brewery. Twin Elephant has had a long relationship with the club, serving as the primary location for club meetings before social distancing forced gatherings online. Barrel bulldogs, or gas transfer tools, can be purchased from brewing supply sites such as MoreBeer!, Homebrewers Outpost, or GW Kent. The club uses a steamer that is connected to a homemade 'L' shaped copper pipe. There are vent holes on the lower end of the 'L' shape that pump the steam into the empty barrel between fills.

To offer ideas for your own club, let's take a closer look at how MASH

has utilized our two barrels.

### BARREL 1

For the initial fill for barrel one back in 2015 all interested club members put their names in a lottery. The eleven members selected to contribute 5 gallons (19 L) of beer decided to brew an imperial stout. A common recipe was developed and each member brought their keg or carboy to fill the barrel on a designated day.

Unfortunately, after a few samplings during aging it was determined the barrel had gone sour and drove the second fill to be a Flanders red. Due to what was most likely impatience the members decided to do a solera pull at six months. After pulling some of the beer from the barrel, the same Flanders red recipe was brewed to top off the barrel again. After another six months the barrel was completely racked and refilled with an oud bruin. The oud bruin was aged in the barrel for one year and then the members chose to attempt a clone of the Tired Hands Orbison golden saison. During this refill the barrel was physically moved between club members' homes. In February of 2019 a solera pull was made of the golden saison with a second pull in June of 2019.

Just as the pandemic was starting the barrel members decided on a dark sour (a clone recipe of The Brewery's Tart of Darkness). In April 2020 the COVID-19 pandemic caused a slight change for the barrel program. What was once an all-day social event where participating members gathered to collectively rack and refill the barrel had to change. The 2020 fill had all participants drop off their brewed dark sour for one member to rack and fill the barrel. All members later picked up their portion.

In May of 2021 the social distance restrictions limited a full collection of barrel participants, but a few more were able to attend to help rack, refill, and provide emotional support for another Flanders red barrel fill.

### BARREL 2

Two years after starting the first barrel project, MASH ordered a second barrel to allow more members to

participate. The second barrel selected was a wine barrel that members hoped would remain clean without the funk the first one developed. This meant that a full rack and refill as well as a deep steam clean would take place as part of preventing the barrel from going sour as long as possible. This provided some mid-barrel day activity of rolling the barrel around to get a good clean.

Twelve participating club members brewed an imperial saison and let the collective brew rest in the barrel in March of 2017. By July the saison was deemed ready and a second fill of the barrel took place with a Belgian dark strong ale. This beer sat in the barrel for a year until it was replaced with a wheatwine in July of 2018.

In January of 2019 the participating members brewed a Belgian triple for the fourth fill. For the fifth fill the club made a change to this barrel. The participating members brewed a golden ale and pitched Funk Weapon #3 from Bootleg Biology. This secondary yeast strain was intended to create a ripe tropical fruit flavor with aromas of strawberry, cherry, and tropical candy. This fill took place during the social distance requirements so, like Barrel 1, it was less of a social event. Most recently in May of 2021 the barrel was filled with a imperial Berliner weisse.

Each barrel is stored at one of the contributing brewer's homes based on storage availability. As expected life happens and the club has seen both barrels moved over the course of the club's barrel program. The barrel sponsors are tasked with conducting the shepherding of the beer and barrel. This program allows up to 12 club members (brewing 5 gallons/19 L each, as we found it is safe to have a bit extra in case some brewers came up a little short) to experience the benefits of barrel-aged beers without having to purchase additional equipment, store a full-sized barrel, or monitor its progress in their homes.

One of the club members with experience in barrel aging tastes the barrel at various stages and makes a determination when the barrel is ready. There is not an exact science



### Barrel Red Sour

(5 gallons/19 L, all-grain)  
 OG = 1.075 FG = 1.012  
 IBU = 14 SRM = 15 ABV = 8.3%



*After the first MASH barrel had already soured we continued to use it to age sour beer styles. This was the sixth recipe that club members brewed for the sour barrel.*

#### INGREDIENTS

- 6.5 lbs. (2.9 kg) Vienna malt
- 5.5 lbs. (2.5 kg) Pilsner malt
- 1 lb. (0.45 kg) Munich I malt
- 8.1 oz. (230 g) aromatic malt
- 8.1 oz. (230 g) Caramunich® I malt
- 8.1 oz. (230 g) Special B malt
- 8.1 oz. (230 g) pale wheat malt
- 8.1 oz. (230 g) demerara sugar
- 4 AAU East Kent Golding hops (60 min.)  
 (1 oz./28 g at 4% alpha acids)
- ½ Whirlfloc tablet (10 min.)
- ½ tsp. yeast nutrients (10 min.)
- White Labs WLP550 (Belgian Ale),  
 Wyeast 3522 (Belgian Ardennes), or SafBrew T-58 yeast

#### STEP BY STEP

This is a single infusion mash with the addition of 3.9 g calcium chloride and 2.1 g gypsum. Phosphoric acid is added to the mash water to achieve a mash pH of 5.1 and sparge water to a pH of 6. Stabilize mash temperature at 154 °F (68 °C) and hold for 60 minutes. Lauter as usual collecting 7 gallons (26.5 L). Boil for 90 minutes adding the hops 30 minutes after the start of the boil and the Whirlfloc and yeast nutrients with 10 minutes remaining in the boil.

After the boil is finished, chill the wort down to yeast pitch temperature, aerate well if using liquid yeast, then pitch the yeast. Ferment at 68 °F (20 °C) for 7 days before transferring into the barrel.

**Partial mash option:** Swap out the Vienna and Pilsner malts for dried malt extract (DME), using 4.3 lbs. (2 kg) Pilsen DME and 2 lbs. (0.91 kg) pale ale DME. Add the remaining crushed grains into 1 gallon (4 L) of water and maintain as best you can a mash temperature of 154 °F (68 °C) for one hour. Remove grains and wash with 1 gallon (4 L) hot water. Add another gallon (4 L) to the wort and stir in the Pilsen DME. Bring to a boil and add the hops. Boil for 60 minutes. Add the pale ale DME with 10 minutes left in the boil. Chill wort down to fermentation temperature then add water to make 5 gallons (19 L). Follow remaining instruction from the all-grain recipe.

### Barrel Tripel

(5 gallons/19 L, all-grain)  
 OG = 1.080 FG = 1.009  
 IBU = 33 SRM = 4 ABV = 9.4%



*This is the fourth recipe members of the MASH homebrew club brewed and filled the second barrel (the clean barrel) with after fermentation for extended aging.*

#### INGREDIENTS

- 13.5 lbs. (6.1 kg) German Pilsner malt
- 1.5 lbs. (0.68 kg) table sugar (sucrose)
- 8.2 AAU Loral Cryo® hops (60 min.)  
 (0.39 oz./11 g at 21.5% alpha acids)
- 2.3 AAU Hallertau hops (10 min.)  
 (0.5 oz./14 g at 4.5% alpha acids)
- 2.3 AAU Styrian Goldings hops (10 min.)  
 (0.5 oz./14 g at 4.5% alpha acids)
- ½ Whirlfloc tablet (10 min.)
- ½ tsp. yeast nutrients (10 min.)
- White Labs WLP570 (Belgian Golden Ale),  
 Wyeast 1388 (Belgian Strong Ale), or  
 Mangrove Jack's M31 (Belgian Triple) yeast

#### STEP BY STEP

This is a single infusion mash with the addition of 3 g calcium chloride, 2.4 g gypsum, 1.8 g of Epsom salt, and a pinch of table salt. Phosphoric acid is added to the mash water to achieve a mash pH of 5.2 and sparge water to a pH of 6. Stabilize mash temperature at 148 °F (64 °C) and hold for 75 minutes. Lauter as usual collecting 7 gallons (26.5 L). Boil for 90 minutes adding the first hops 30 minutes after the start of the boil and the second hop addition, sucrose, Whirlfloc, and yeast nutrients with 10 minutes remaining in the boil.

After the boil is finished, chill the wort down to yeast pitch temperature, aerate well if using liquid yeast, then pitch the yeast. Ferment at 68 °F (20 °C) for 7 days before transferring into the barrel.

**Extract option:** Swap out the Pilsner malt for 7.3 lbs. (3.3 kg) Pilsen dried malt extract (DME). Start with 3 gallons of water and bring up to almost a boil. Turn off heat and add half of the DME. Bring to a boil and add the first hop addition. Boil for 60 minutes. Add the second half of DME along with the second hop addition, sucrose, Whirlfloc, and yeast nutrients with 10 minutes left in the boil.

Chill wort down to fermentation temperature then add water to make 5 gallons (19 L). Follow remaining instruction from the all-grain recipe.

to this; it is more of a testing until it's determined to be ready.

### FILLING THE BARREL

Once the barrels arrived they were inspected to make sure there were no cracks or obvious leaks. Prior to filling with beer the barrels were filled with warm water over 170 °F (77 °C). After the barrel was filled a second inspection was done to look for leaks. The barrel should sit for up to 24 hours to

allow any staves to expand to stop any leaks present. After the club was happy with the retaining capability of the barrel the water was emptied.

The steamer should be put in for 20 to 25 minutes. While the barrel is being steamed the kegs should be prepped to fill the barrel. Filling from Corny kegs should be a similar setup for any kegerator with CO<sub>2</sub> being injected in the "in" port and an open ended hose should be connect-

ed to the "out" port. Ensure that the "out" port hose is first in the barrel and touching the bottom or close to touching the bottom of the barrel before filling to avoid oxidizing the beer. For CO<sub>2</sub> pressure the club found success at around 12 PSI. We recommend that an extra member brew a batch or asking members in the club to brew more beer than the barrel can hold to account for any members who were not able to reach exactly 5 gallons (19 L). This ensures the barrel is completely filled and does not allow the top staves to dry out. The barrel is monitored and if the fill level drops too much then more of the original recipe can be brewed and added to top off the barrel.

### RACKING FROM THE BARREL

Again, racking from the barrel can be done by siphoning, but since we invested in a barrel bulldog here are the steps we use: First begin with sanitizing the bulldog. Remove the bung and drop the bulldog down to the bottom of the barrel. Tighten the bung stop to create an airlock and connect the bulldog to the CO<sub>2</sub>. Similar to dispensing from Corny kegs, the CO<sub>2</sub> level should only be enough to allow the beer from the barrel to smoothly flow out into the waiting kegs. With either the siphon tube or bulldog the fill tube should be connected to a sanitized hose that is placed in the bottom of the Corny keg to be filled. One member removes the lid, empties any sanitizer from the keg, and sprays down the lid with sanitizer. Just like filling the barrel the hose should be at the bottom of the keg to avoid oxidation. Once the keg is filled the lid is replaced and CO<sub>2</sub> is injected in the "in" port to flush out any oxygen.

Once the kegs are filled members collect them to either carbonate or further age on fruit or adjuncts.

While COVID has made some of the more recent racks and refills virtual, we look forward to the time when these events can get back in person. And even when we can't all be involved in each step, the barrel program has kept homebrewing exciting and increased the communal feel within the club during these times. (BYO)

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# Into the Heislerverse

## A QUEST TO CREATE HOLLYWOOD'S MOST FAMED FICTIONAL BEER

by Paul Crowther

**S**hared cinematic universes have become a big thing since the success of the Marvel Cinematic Universe, or MCU. The MCU started with *Iron Man* back in 2008 and now consists of 23 movies (at time of writing) and a bunch of spinoff TV shows too. Rival comics company DC has had a couple of DC universes since then, and has a separate TV universe to complement its film universe.

Some commentators would say the MCU was the first shared universe, that it spawned this phenomenon, but what if I told you there was a much older shared television and film universe. One so expansive and complicated it dwarfs the MCU, a shared universe joined together solely by beer: The Heislerverse!

Heisler may sound familiar to you. The name sparks that annoying hint of a memory you just can't place. Like that actor you see on screen, and you just know you know them but don't know where from. The kind of thing you need to look up online or it'll bug you all day. So familiar in fact you might remember drinking it when you were at college, or a favorite bar having it on tap. Those memories, however, aren't true because Heisler is entirely fictional.

Heisler is a fake beer brand produced by Hollywood props company Independent Studio Services (ISS). ISS makes anything and everything a film or TV production may need, from guns and uniforms, to fake bones, blood and guts, to jewelry, books, flags, luggage, and I'm sure they'd find you a kitchen sink if you needed one. But one of ISS's most popular products is their range of fake beers, which includes their best-selling Heisler beer. I reached out to ISS to talk about Heisler and spoke to their Vice President Angie Csernay.





HEISLER  
GOLD ALE

HEISLER  
GOLD ALE

Brewed with a variety of specialty malts including Munich and chocolate malts

5% ALC/VOL (10.0% ALC BY VOLUME)

11.2 FL OZ (335 ml)

Photo by Charles A. Parker/Images Plus

Angie told me that Heisler was first conceived in 1996 by company founders Shari Skadden and Gregg Bilson. They hired an artist who designed the first Heisler bottle label and the design was updated in 1998 by senior designer Kirk Skadden, who remains with ISS to this day.

ISS produces Heisler bottles, cans, boxes, and beer tap handles. They make safety glass bottles so that they can be used in stunts. They even fill the bottles with a non-alcoholic beer so an actor can drink from them through multiple takes without getting blind drunk. The brewery producing that non-alcohol beer is a closely guarded secret. While bottles get non-alcoholic beer, prop cans being opaque are filled to order at the preference of the actor, so they sometimes contain seltzer water or soda instead.

Why would a TV show need a fake beer instead of using a real brand anyway? Brands pay handsomely for product placement on TV shows, so why pass up that opportunity? Well because getting an alcohol advertising contract is exceedingly difficult and can be a bit of a legal minefield. If you feature alcohol product placement in the United States, FTC regulations require that 70% or more of your audience should be over the age of 21. This rules out anything appealing to a teen audience or family viewing.

But there may come storylines where you want your characters to drink a beer or just have some on a shop shelf or in a home fridge, so that's where fake beer brands come in to add a sense of a realism without incurring the regulations that apply to product placement.

Heisler is in fact so popular that ISS took out a trademark on the Heisler brand — this is thought to be the only fictional brand that has been trademarked. ISS do own other beer brands too, including Jekyll Island and Haberkern, but none are as popular as Heisler.

“The Heisler design is so versatile and timeless that it works in just about every scenario, which also lends to its popularity,” Angie said. “Heisler can play just as convincingly

at a frat party or hipster dive bar as it can in a rough cowboy bar or at home on the couch in the hand of a regular Joe.”

Heisler has been around since the mid-nineties supplying this need for fictional beer to innumerable television shows and movies. An incomplete list on the website fictional companies wiki (yes, there really is a website for everything) lists over one hundred TV shows and films that Heisler features in. From Jess and her roommates chugging back bottles in *New Girl*, to Lorelai and Luke drinking them while decorating Luke's Diner in *Gilmore Girls*, to their cardboard boxes being used to make makeshift prom King and Queen crowns in *Glee* and bottles getting the forensic science montage treatment on *CSI*, Heisler has been absolutely everywhere.

And it stands to reason that if this beer doesn't exist in the real world and it does exist in all these TV shows then they must be in a shared universe: The Heislerverse! (And to those naysayers out there reading this, saying, “But it's just a prop, it doesn't mean they're all connected,” I say leave me alone and let me have my fun.)

Though based on a rock solid basis of shared beer branding, this Heislerverse however is not without its minor plot holes. For one, there are in fact at least three different apocalyptic futures shared within the universe. Heisler shows up in the *Walking Dead* spinoff *Fear the Walking Dead*, *Terminator: The Sarah Connor Chronicles*, and *The Colony*, giving us alien, robot, and zombie apocalypses in the Heislerverse. But who's going to pick up on niggly little plot holes like that?

There's also the fact that Sarah Wayne Gillies plays three different characters in Heislerverse shows, but haven't people heard of long lost triplets?

## BREWING HEISLER

So for this legendary beer that connects a good chunk of television into one shared universe, there is but one problem. It's not available in any bar near you, or any supermar-

ket or corner store. It exists only on TV, even the brewery that makes its real non-alcoholic contents is secret so we can't drink it, unless we make it ourselves.

And that's when it hit me.

After all, when has a little thing like not being able to get hold of a brand ever stopped a homebrewer? That's why we have clone recipes. So for us to be able to step into the Heislerverse ourselves I set about creating a clone recipe we could all enjoy.

I can almost hear you ask, as indeed the editor of *Brew Your Own* did when I pitched this article, “How do you design a clone recipe for a beer that doesn't really exist?” And while it's true that most of the usual routes for coming up with a clone recipe are closed off to us — we have no brewery we can contact and we can't smell or taste the beer — that doesn't mean there aren't clues for us to figure out how to remake this beer.

Heisler's packaging feels similar to a lot of mass-market lager brands. Indeed this was considered upon Heisler's inception as Angie told me it “was designed to convince the audience that it is a real beer brand. The driving force behind our designs is to hide in plain site on screen. To achieve that blend-ability.” It feels like it would sit on the shelf between Heineken and Budweiser so you might think a Pilsner would be the starting point, but you'd be wrong. On Heisler's packaging it is clearly identified as a “gold ale.” There is a “British Golden Ale” style in the Beer Judge Certification Program (BJCP) guidelines, but colloquially golden ale or gold ale are used interchangeably with pale ale.

I asked Angie about the wealth of technical beer information seen on the branding and how they had decided this. As it turns out not much thought had actually been put into this, because as Angie points out, “The original design team also didn't have the pressure of the viewers' current ability to pause and zoom into every little detail of a scene as our current design team now has to take into consideration. Ingredients lists on our fictitious products created in



## HEISLER

(5 gallons/19 L, all-grain)  
OG = 1.053 FG = 1.015  
IBU = 30 SRM = 7 ABV = 5%



After seeing the infamous Heisler bottles, cans, and tap handles throughout television shows and movies, this is my rendition of the “gold ale,” which is much like an American pale ale crossed with an American amber ale.

### INGREDIENTS

8.5 lbs. (3.9 kg) 2-row pale malt  
1.25 lbs. (0.57 kg) Munich malt  
1.25 lbs. (0.57 kg) Vienna malt  
3.5 oz. (100 g) melanoidin malt  
0.5 oz. (14 g) chocolate malt  
4.6 AAU Nugget hops (60 min.)  
(0.35 oz./10 g at 13% alpha acids)  
7 AAU Cluster hops (5 min.)  
(1 oz./28 g at 7% alpha acids)  
13.75 AAU Cascade hops (5 min.)  
(2.5 oz./71 g at 5.5% alpha acids)  
SafAle US-05, Mangrove Jack's M44  
(West Coast Ale), or White Labs  
WLP001 (California Ale) yeast  
¾ cup corn sugar (if priming)

### STEP BY STEP

Mash grains at 149 °F (65 °C) for 60 minutes. Batch sparge for 15 minutes at 162 °F (72 °C). Bring wort to a boil and conduct a standard 60-minute boil. Add Nugget hops at start of boil. Add Cluster and Cascade hops five minutes from flameout.

After the boil is finished, cool wort down to 65 °F (18 °C) and transfer to fermentation vessel. Add yeast as directed, a small yeast starter is often recommended if using a liquid strain.

Ferment at 66 °F (19 °C) until signs of fermentation are complete. Let condition in the 60s °F (upper teens °C) for one week prior to packaging. Carbonate to 2.5 volumes CO<sub>2</sub> either in bottle or keg.

## HEISLER

(5 gallons/19 L,  
partial mash)  
OG = 1.053 FG = 1.015  
IBU = 30 SRM = 7 ABV = 5%



The real-deal Heisler, brewed by the author as he slipped into the Heisliverse.

Photo by Paul Crowther

### INGREDIENTS

4.5 lbs. (2 kg) extra light dried malt extract  
1.25 lbs. (0.57 kg) Munich malt  
1.25 lbs. (0.57 kg) Vienna malt  
3.5 oz. (100 g) melanoidin malt  
0.5 oz. (14 g) chocolate malt  
4.6 AAU Nugget hops (60 min.)  
(0.35 oz./10 g at 13% alpha acids)  
7 AAU Cluster hops (5 min.)  
(1 oz./28 g at 7% alpha acids)  
13.75 AAU Cascade hops (5 min.)  
(2.5 oz./71 g at 5.5% alpha acids)  
SafAle US-05, Mangrove Jack's M44  
(West Coast Ale), or White Labs  
WLP001 (California Ale) yeast  
¾ cup corn sugar (if priming)

### STEP BY STEP

Place crushed grains in a large muslin bag. Submerge grain bag in 1 gallon (4 L) of water at 162 °F (62 °C) to settle temperature at 149 °F (65 °C) and try to hold at this temperature for 60 minutes. Slowly wash grains with 1 gallon (4 L) of hot water. Add another gallon (4 L) of hot water to the wort and add half of the dried malt extract. Stir until all the extract is dissolved then bring wort to boil. This is a standard 60-minute boil. Add Nugget hops at start of boil. Add Cluster and Cascade hops and second half of the dried

malt extract five minutes from flame-out. After the boil is finished, cool wort down to 65 °F (18 °C) and transfer to fermentation vessel, then top up with water to 5 gallons (19 L). Add yeast as directed, a small yeast starter is often recommended if using a liquid strain.

Ferment at 66 °F (19 °C) until signs of fermentation are complete. Let condition in the 60s °F (upper teens °C) for one week prior to packaging. Carbonate to 2.5 volumes CO<sub>2</sub> either in bottle or keg.

### Tasting Notes:

Heisler has everything that comes to mind when I think about an American pale ale. The Nugget imparts those resinous, pine, herbal background notes and the grapefruit character of the Cascade bursts through and takes center stage.

The beer has a velvety mouthfeel from the more complex malt bill. Caramel and toffee notes come from the Vienna, Munich, and melanoidin malts and are a pleasant addition and not cloying at all.

Not too bitter, nothing too assertive within this beer to stop it being a great session beer that could catch on worldwide, no matter which universe you are a part of.

the 90s could be as ridiculous and creative as the designer wished.”

“When the Heisler Beer was first created, there was no possible way the designer could have foreseen its popularity or known anyone would even notice the small text she chose to denote malts and ABV. Today is a very different story!” she said.

Angie suggested these small details then — that the designers never expected anyone to actually be able to read — were likely taken from beers the designers may have seen in store shelves or on a bottle of beer in their own fridge. The internet was in its infancy in the 90s and you couldn’t just find out what ingredients might be appropriate for a gold ale as easily as you can today, so the ingredients aren’t exactly what you might think. In fact, it may sound more like a dunkel or amber ale when looking at the ingredients, however we’re going to call it a gold or pale ale, since that’s what is clearly stated on the label.

Heisler’s bottle box proudly proclaims it is “Brewed with a variety of specialty malts including Munich and chocolate malts.” I use Munich malt in almost all of my pale ales to add a bit of malty sweetness and color, but the chocolate malt might seem harder to justify. Any significant amount and we’ve got an amber ale or a porter rather than a gold ale. The addition of chocolate malt can be useful in pales, however. If you use a very small amount (1% or less of the total grain bill) of roasted malts in pale ales it can help with head retention without affecting the color too much.

Digging deeper, we actually learn a little about Heisler’s brewery in the information down the side of the label. Alongside some nutritional information it states that Heisler is brewed and canned at “Heisler Industries, Bavaria.” So this is a German brewery, a Bavarian brewery no less.

If it’s a Bavarian brewery it seems fitting we stick to the Reinheitsgebot, the historic Bavarian beer purity law that states beer should only consist of four ingredients: Malt, water, hops, and yeast. So that means we’ll be avoiding adjuncts for the recipe.

Knowing Heisler is a German brew-

ery would lead me to want to use German hops for the recipe, but it doesn’t feel quite right to do so. There’s nothing about the branding that makes me think this is a traditional German beer. “Gold Ale” certainly isn’t a German style, and Bavaria is far more famous for its lagers and wheat beers. The beer is also marketed worldwide — it shows up in Britain in an episode of *Inside Number 9* and Australia in *The Good Place*. Such a beer aimed at a worldwide market I suspect would use American hops.

But what American hops to use? There are so many these days, and there is no clue on the packaging as to what flavor the beer is or what hops might be used. The thing is though, that Heisler as a prop was invented in 1996 and first aired on TV in 1997 (unfortunately we don’t know the exact show that started the Heislervers because ISS doesn’t have records going that far back). The beer being around since the late 90s immediately precludes a lot of modern hops such as Citra®, Mosaic®, and Simcoe®. All these modern citrusy hops weren’t bred or commercially available until the 21st century, so that whittles our choices down.

For the recipe I’ve gone for some more classic American hops. Cluster is actually the oldest hop grown in America. It imparts a blackcurrant flavor but also a gentle bit of spice. Nugget was a fairly popular hop for bittering in the mid-nineties as one of the early high-alpha hops. And finally, Cascade, which has been a core hop for American pale ales for decades. I’m a massive fan, so if I’ve found an excuse to throw a bit of Cascade in the boil I’m going to take it.

The question of strength is decided for us on Heisler’s packaging, where the ABV is clearly given as 5%.

What we end up with then is a sessionable pale ale that would have mass market appeal. A breadly, slightly sweet malt base and a moderate hop aroma with grapefruit from the Cascade, pine from the Nugget, and spice from the Cluster hops. And if you brew this beer you’ve not just made a tasty beer, you’ve written yourself into the Heislervers. (BYO)

## Heisler has been featured on ...

- *2 Broke Girls*
- *3: The Dale Earnhardt Story*
- *Accidentally on Purpose*
- *Beerfest*
- *Blue Bloods*
- *Bones*
- *Brooklyn Nine-Nine*
- *Burn Notice*
- *Chicago P.D.*
- *Criminal Minds*
- *CSI: Crime Scene Investigation*
- *Desperate Housewives*
- *Everybody Hates Chris*
- *Footloose*
- *Ghost Whisperer*
- *Gilmore Girls*
- *Good Girls*
- *Glee*
- *Grace and Frankie*
- *How I Met Your Mother*
- *How to Get Away with Murder*
- *It’s Always Sunny in Philadelphia*
- *Key and Peele*
- *The League*
- *Lucifer*
- *Malcolm in the Middle*
- *Mike & Molly*
- *My Name is Earl*
- *New Girl*
- *Parks and Recreation*
- *Pretty Little Liars*
- *Prison Break*
- *Raising Hope*
- *Reno 911!*
- *Star Trek: Enterprise*
- *Roseanne*
- *Superbad*
- *The Social Network*
- *Training Day*
- *Two and a Half Men*
- *Tyler Perry’s House of Payne*
- *Ugly Betty*
- *Veronica Mars*
- *Weeds*
- *White Collar*

And many more ...





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# Brewing Down Under

**A**ussies have always loved beer. When I was growing up in Australia in the 1980s it was just a simple beverage: A thirst-quenching lager of about 5% alcohol. In my state of New South Wales, two mass-produced lagers dominated: Tooheys and Victoria Bitter.

A quick aside: Interestingly, Fosters is not popular in Australia. It might be “Australian for beer” in the United States, but for the last decade much of it has been brewed in Fort Worth, Texas.

Like their equivalents in the U.S., the taste profile of the Aussie mass market beers aren’t very complex. When I was younger, however, any content these beers lacked in the drinking experience was made up for in their television advertising. These provided a vision of the great Aussie male — sports heroes, farmers, and blokes just mowing their lawns. The images, melodies, and lyrics from 1980s beer ads haunt me to this day.

Victoria Bitter pitched their beer advertisements at farmers accompanied by the “How the West Was Won” soundtrack. You’d see a dairy farmer emerge from under a cow. He’d stand, wipe his brow, and glance upwards looking thirsty. The narrator crowed: “You can get it milking a cow. Matter of fact I’ve got it now.” *It* signifying being thirsty for a beer.

The Tooheys TV ads were less poetic, but arguably more moving. They’d feature a group of blokes singing together after winning their football game: “I feel like a Tooheys! I feel like a Tooheys! I feel like a Tooheys, draught brew!” The last two words were shouted loudly so you got a tune out of that string of exclamations.



Photo by Charles A. Parker/Images Plus



# Australia's Developing Brew Scene

by Danny Wood

How things have changed. But only recently. According to Australia's Independent Brewers Association (IBA) there are now more than 600 independent brewers, the majority of which have opened in the past decade.

## A GROWING TREND OF CRAFT BREWERS

A local Aussie beer expert, Justin Lill, agrees that the nation's beer landscape is quickly evolving. Lill is the owner of Wine and Beer in the beautiful tourist town of Berry, a couple of hours south of Sydney and ten minutes from the beach. He dates the beginning of Australia's current craft beer craze — and his own — at less than ten years ago.

It really started with foreign brews and, early on at least, Lill's popular craft beers drew in the customers with their packaging rather than taste. The first craft beer to really take off in his liquor store was Italian: Birra del Borgo. "I suppose it was about eight years ago now. We were already doing a small amount of craft beer by then. When they came in, these Italian beers were good, but the packaging of the Italians was exceptional. They went berserk (Australian for 'sold very quickly') and that was the beginning of it all."

Lill was actually more of a wine guy (Australia has historically been known more for its wines), but he considers himself a beer convert these days and his rationale for loving craft beer offers an insight into a typical Australian's beer psyche.

"You start to sample some of these craft beers, and you go, wow! These are as good as the best wines in the world when they're made right and they're a lot more affordable."

These days, Lill's shop is known for its craft beer. Some people travel hours to sample his range that includes about 500 different beers from

all over the world. About half of his selection are brewed in Australia, many of which are limited releases.

And while his shop is apt to feature a blueberry milkshake beer from a brewery that got its hands on some fresh blueberries, or a small batch coffee porter, Lill laments that the Aussie beer market is still largely dominated by the big commercial brewers.

In the U.S. there are more than 8,000 craft brewers who together have about 25% market share. In Australia, the IBA states that more than 4% of the total volume of beer is produced by independent brewers. Much like in the U.S., most craft beer drinkers are in urban areas.

"They're just starting to take to craft beer in the bush (rural areas). So hopefully more people's taste buds will end up doing the talking for their brains," Lill says.

Also similar to other countries with a developing craft beer scene, the strategy of some big commercial brewers in Australia is to stop the popular craft brewers by buying them up. That isn't new. Thirty years ago a craft beer called Redback was the first one in Australia to take significant market share, somewhere between 2 and 8%.

"When Redback first came out it was a lovely wheat beer. I think a commercial brewery still brews it today and if you had it, it doesn't taste anything like the original," Lill says.

Another of Australia's popular craft brews, Little Creatures, was bought by the Japanese Kirin Company (which also owns the Tooheys brand). The beer went from being brewed in Fremantle, Western Australia, to the other side of the country, in Geelong, Victoria.

"That's why this craft beer thing is so exciting because there's so many new start-ups, the big companies can't stop them," Lill says.

## POPULAR STYLES

Lill has noticed a few trends in today's Aussie craft brewing market. One recent trend is sweeter beers, such as the chocolate stouts brewed by Daynton in Melbourne, which offers many variations including ones with peanut butter and vanilla.

Sours are also a big thing in Australia at the moment. Lill says there are two very different styles, one a lighter, lower-alcohol version with a more subdued sourness and overall flavor. The other version bursts with taste and texture while sporting a higher ABV. In Lill's opinion, the two leading sour makers in Australia are Hope Brewery, located in the Hunter Valley, one of Australia's leading wine regions, and One Drop Brewing Co. in Sydney.

Like brewers everywhere, many Aussie craft brewers are elbows deep in hops, constantly experimenting with hop combinations to create new flavor and aroma profiles. Many of the hops are grown in Australia, including American varieties and those with Australian fame such as Galaxy™ and Vic Secret™.

Rowan Florence is an accomplished homebrewer and Social Media Manager for Brewmart Bayswater, a brewing



Justin Lill outside his Berry shop Wine and Beer.

Photo courtesy of Justin Lill



Mazen Hajjar, Owner of Hawkers in Melbourne, Australia, produces 34,000 barrels of beer a year.

supplies store in Perth, Western Australia. (While Justin Lill and Rowan Florence are separated by a column or two in this story, Berry and Perth are as far apart geographically as San Francisco and New York City. By getting a second opinion here, I've really done the hard yards.)

"As always, necessity is the mother of invention and we have hop growers with great breeding programs here in Australia that are keeping up to date with the latest and greatest hops," says Florence.

Given the relatively small spectrum of hop varieties grown in Australia and New Zealand, Aussies still source a lot of hops from overseas.

"We are very lucky that Galaxy™ is grown here as it is up there with one of the most popular hops used in Australia," he says. "We love supporting local business and will always do so when possible. A few different U.S. hops are grown here but the overwhelming majority aren't, so we do import a lot of hops from the U.S. There are a number of great hops grown in New Zealand too that us Aussies love to get our hands on," he says.

So what are they brewing with all of those hops? Well, it shouldn't be a surprise when Florence says that hazy IPAs have taken Australia by storm.

"It's not uncommon to see a handful of different ones on tap in any bar you go into," he says. "Pale ales have always been, and always will be, a firm favorite for many beer drink-

ers and the sheer number of varieties now available means that they never get boring."

John Preston, from brewing and winemaking supplies store Grain and Grape in Melbourne, Victoria agrees that hazy IPAs are a big thing, having become hugely popular in the past five or six years.

"Australian beer lovers are quickly drawn to new flavors and the hazy beer craze where the magic of biotransformation happens is no exception. All Aussie craft breweries have their own version of a NEIPA, many have more than one, and I have to say that Ben's Lefty Juicy NEIPA is one of our best selling fresh wort kits," says Preston.

Florence also says easy drinking sour beers, like the ones Lill referred to, are a fairly new addition to the Aussie tap list and quickly gaining widespread appreciation. Florence says that could be a result of Australia's thirst-provoking hot summers.

The Brewmart Social Media Manager says Aussie craft brewers are very innovative and always coming out with new beers. For example, lighter sour beers with different fruit, and extra pale ales (XPAs) with new hops are two that spring to mind. "But as always, it is difficult to say what will be a temporary trend or a style that will stick with us."

Barrel-aged beers are growing in popularity in Australia as well, but still tend to be the domain of more hardcore brewers.

"With more and more commercial breweries releasing beers that have been aged on wood it is slowly increasing in popularity with homebrewers," adds Florence. "The summers are hot in Australia, which doesn't lend itself well to heavy barrel-aged stouts but there is still a huge amount of room for more sour and funky beers to be aged on wood and innovation in other styles as well."

### HAWKERS IN MELBOURNE: LEBANESE AIRLINE OWNER TO AUSSIE BREWMASTER

The owner of one of Lill's favorite Melbourne craft breweries, Hawkers, has lived a few lives. Lebanese-Australian, Mazen Hajjar was a war photographer, an investment banker, and, he says, started two airlines, but was always "obsessed" by food production and flavor. He considered starting a winery, but says his former homeland, Lebanon, is saturated with wineries. Then he had a eureka moment.

"I was sitting with my Danish best friend having dinner and he said, 'You keep complaining about corporate life, what do you want to do?' and I said, 'I want to make beer.'"

Hajjar was partly inspired by watching Heineken muscle into the Lebanese beer industry, buy out two local breweries and, he says, force Guinness to pull out of the country.

"I hated the fact that I didn't have any choice any more in what I could drink. So, I decided to make my own stuff, never having been to a brewery in my life."

So, what do you do when you want to start a brewery, but you know absolutely nothing about brewing beer? You subscribe to the world's leading homebrew magazine, of course!

"My first subscription to *Brew Your Own* was, I think, in 2004. I couldn't understand what the \*\*\*\* I was looking at. But I had a full year's subscription and I thought it would be useful at some point."

Hajjar took those issues of *BYO* with him to Canada where he studied to become a brewmaster. On his return home to Beirut, Hajjar says he founded the Middle East's first craft brewery during the 2006 Lebanon War between



Israel and Hezbollah. He called it 961, named after the country code.

Eight years later, he was exporting to 26 countries, one of them Australia.

“I was with my distributor in Sydney and we were knocking on doors trying to sell the beer — because he didn’t know anyone. He said, ‘You’ve gone back to your roots, you’re a hawker!’”

Hajjar says he didn’t know what that meant but learned that the first Lebanese immigrants to Australia in the 1800s were hawkers and street vendors. In 2014 he migrated to Australia and started his craft brewing operation in Melbourne.

“And that’s how Hawkers started, with four people and the capacity to make 600,000 liters (5,000 barrels). We were brewing once or twice a week,” he says.

Hawkers now employs 50 people, makes over 4 million liters (34,000 barrels) of beer a year and brews 4 to 6 times a day.

“Our approach to making beer is we make whatever the hell we want to drink. We’re very finicky about our quality. We have a massive lab at the back where we do a lot of measurements and instrumentation to make sure everything is right.”

The core range of beers includes a Pilsner, a pale ale, an IPA, a hazy pale ale, a West Coast IPA, and a stout.

“We’ve also got two sours, one of them is a 4-percenter with wild berries, the other is 7% with yuzu and plums, and then we have semi-annual releases, our Double IPA, and our Double West Coast.”

Hawkers also does lots of limited release beers and, according to Hajjar, has one of the biggest barrel programs in the country.

“Every year we release multiple new stouts, including many barrel-aged variants,” he says.

Hawkers also produces a whiskey called Feedback Loop by making a wash from a barrel-aged imperial stout, which is then aged in the barrels. At Hawkens they describe it, in a somewhat Monty Python style, as: Bourbon Barrel Aged Imperial Stout Barrel Aged Bourbon Barrel Aged Imperial Stout Whisky.

Hajjar has brewed hazy IPAs on limited release but he’s planning a permanent one given the style’s increasing popularity.

“Our hazy will have some Australian and some New Zealand hops in it. We’re not just going for the traditional big, American hops, we’re trying as much as possible to use farmers that we know and like and to engage with those farmers to try and give a better expression of those hops in our beer.”

Their award-winning West Coast IPA is made with Southern Cross, a New Zealand hop variety that Hajjar says many craft brewers have forgotten about (find the clone recipe on page 54).

“Our approach to using hops isn’t necessarily using all the newest and

coolest hops that are trendy but more to do with a real understanding of the hop itself and what imparts what flavor and approaching the use of hops with a very open mind,” he says.

## ONE DROP IN SYDNEY: FREEDOM, LOVE, AND BEER

In Melbourne’s rival city, Sydney, the man behind another of Australia’s heralded breweries started off as a curious homebrewer.

“A former BP marine engineer I was living with at the time found a neglected homebrew kit in the back garage,” says Nick Calder-Scholes, Head of Production at One Drop Brewing Co.

“With his engineering skills and my crazy ideas we made a great team to explore this new hobby, that hobby

## *The Brit Who Became an Aussie Homebrewer*

Homebrewing is quite popular in Australia, but it’s hard to judge just how popular. A 2017 survey by the Aussie Beer Cartel, a Sydney beer shop with a popular blog, received responses from 2,500 homebrewers. The study found that the homebrew industry grew 3% during the previous year and the most popular beers to brew were pale ales and IPAs. About a quarter of Aussie brewers who responded entered competitions or were members of brewing clubs. A quarter of responders also stated they continue to use the brew-in-a-bag (BIAB) method made popular Down Under years ago.

Aussie homebrewers, like Paul Haines — an intensive care paramedic and clinical nurse, from the country town of Yass, in New South Wales — are very serious about their art.

“I work with some people that are heavily into homebrewing and have semi-professional setups with some serious equipment. Some of these guys produce some of the best beers I’ve ever tasted and can easily emulate what commercial craft brewers are making,” he says.

Haines grew up in England where, he says, the wide variety of well-priced, high-quality beers meant homebrewing never really crossed his

mind. When Haines married an Australian and moved Down Under about a decade ago, his beer world changed.

“I found the quality and variety of the beer (at that time) to be poor. I also found the cost of what craft beer was available prohibitive,” he says.

Haines’ Aussie brother-in-law suggested he try homebrewing.

“It turned out to be far easier than I realized as well as self-fulfilling and saved me a lot of money,” he says.

Using two 6-gallon (23-L) fermenters Haines brews about 36 gallons (136 L) per year. His favorite style is IPA, particularly those brewed with Australian Galaxy™ hops.

“I’ve never tasted a beer I didn’t like with Galaxy™ hops. I’m also a big fan of American Amarillo® and American Chinook hops, which I find go well with Galaxy™.”

He also grows his own hops, which are mainly Cascade. For Haines, homebrewing is much more than a creative experience.

“The actual making of the beer is therapeutic in a mindful sense. It’s also very satisfying sharing a homebrew with friends who appreciate your beer and are keen to learn more about your brewing techniques and ingredients.”

turned into passion, and that passion turned into our own breweries.” (That roommate was John Taylor, who went on to co-found Drop Project Brewing in London, UK.)

In his homebrewing days, Calder-Scholes tried to replicate his favorite beers, like Little Creatures, Sierra Nevada Pale Ale, and Three Floyds Zombie Dust.

One Drop Brewing Co. opened in 2019. and brewed about 2,000 HL (52,834 gallons) of beer last year. Calder-Scholes says the brewery is inspired by the same foundational ideals as reggae music with its signature one drop drum beat.

“The same ideas of community, humanity, one love, free thinking, and unique creative self-expression inspire us,” he says. “One Drop is all about freedom, love, and going with the flow; with great tunes, tasty food, and amazing beers, all perfect to chill with and take in the vibes.”

Their first beers included an XPA, a Bohemian lager, and a passion fruit kettle sour. All three are still regulars in their taproom.

“We make a lot of fruited sours, pastry stouts, traditional lagers, nitro beers, and experimental ales. We are always looking out for what’s new in the industry and regularly collaborating with suppliers to test new yeasts, hops, malts, and equipment,” says Calder-Scholes.

And of course, hoppy beers are some of the best sellers. He says they’ve experimented with a range of late hopping techniques.

“We are always researching and asking industry folk about this. We’ve played with recirculation for 2, 4, 8, 24, and even 48 hours! Dropping into the top and capping. Adding start, middle, end of fermentation — or a mix of all three. Right now we are having success with adding into the top of the fermenter and rousing from the bottom.”

Calder-Scholes uses a lot of both Australian and New Zealand hops, often from the New Zealand hop-growing region Nelson.

“I prefer Vic Secret™ over Galaxy™, to be honest. I find it has all the same qualities, maybe even more

*Continued on page 57*

## Q&A with Aussie Homebrewing Experts

**Rowan Florence is a veteran homebrewer who works at Brewmart Bayswater, a homebrew supplies store in Perth, Western Australia.**

**John Preston owns Grain and Grape, a beer and winemaking supply store in Melbourne. He opened his first brewery and homebrew supplies shop in 1990. Preston is involved in the Australian National Homebrewing Conference with conferences held every other year since 2008.**

### WHEN AND WHY DID YOU GET INTO HOMEBREWING?

**Rowan:** I originally started brewing when I was about 20. It didn’t take long to be bitten by the bug and I haven’t looked back since. I have always been a fan of cooking and everything DIY so, coupled with a healthy enthusiasm for beer, it seemed that brewing my own beer was the next natural progression. The satisfaction of coming up with an idea, working on the recipe, and brewing a great beer is immense and with new ingredients and styles appearing all the time the options are limitless.

**John:** There was a brewpub in Melbourne in the 1980s called The Loaded Dog. A mate and I used to really enjoy some of the beers they sold there (remember that this was well before the craft beer movement came to Australia) and we decided that if they could do it, why couldn’t we? That led to lots of homebrewed beer and, ultimately, Grain and Grape.

### HOW MUCH BEER DO YOU MAKE, ROUGHLY?

**Rowan:** Generally, I brew two or three times a month, usually 23-L (6-gallon) batches if I am trying a new recipe or tweaking one I am working on. I almost always have my favorite pale ale and kettle sour on tap so for those I will usually brew 46 L (12 gallons) and mix it up with different dry hops or fruit additions for a bit of variety.

**John:** Having a family and a business to run means I don’t get to brew as much as I would like, but I do usually manage to get five or six brews a year done. So, maybe a hundred liters (27 gallons) a year. Unless you count the fresh wort kits we produce at the shop, in which case it is about 8,000 liters (2,114 gallons) a month.

### CAN YOU DESCRIBE YOUR HOMEBREWING SETUP/PROCESS?

**Rowan:** I brew all my beer at home and now am lucky enough to have an electric system as well as my bigger gas-fired system so come rain or shine, I am able to brew regardless of the weather. In terms of hot-side equipment my setup is quite basic — I use a Brewzilla 65 liter (17 gallon) all-in-one electric system that makes life very easy. Mashing and boiling in the same vessel is very convenient and cleanup is a breeze.

When it comes to fermentation my setup is a bit more involved. I don’t think that there is anything more important when making beer than making sure the yeast are happy and in the best environment to do their job so temperature control as well as pressure fermenting have both become important steps in my process. I ramp up the temperature towards the end of fermentation for a diacetyl rest and cold-crash at the end to drop as much sediment out of the beer as I can. Oxidation is a problem that has bugged me in the past, so about three days into fermentation I attach a spunding valve and let the rest of the ferment finish under pressure to minimize oxygen ingress. Transferring under pressure to a purged keg has really helped eliminate the risk of oxidation in my beers.

**John:** Living in inner city Melbourne, I don’t have too much space to dedicate to brewing, so it happens outside where the aromas don’t interfere with family life. I brewed for many years on a Speidel Braumeister and over the years I have brewed on electric and gas 3-vessel systems and built my own HERMS (heat exchange recirculation mash system). I have re-



cently moved to a small brew-in-a-bag system. I'm enjoying the sheer simplicity and the "hands on" nature of brewing this way. A converted fridge maintains fermentation temperature and I keg my beer (like an adult should), serving with a Pluto Beverage Gun.

### **WHEN IT COMES TO HOPPY BEERS, WHAT LATE HOPPING TECHNIQUES DO YOU USE?**

**Rowan:** I am an avid reader of anything brewing related so whenever I see a new technique that I can incorporate I have to give it a try. For most of my hoppy beers these days I give them a bittering charge at the beginning of the boil then save most of the kettle hops for the last ten minutes of the boil. For extra punch I often add a whirlpool hop addition for 20 minutes at about 80 °C (176 °F) and then a healthy dose of dry hops. The grassy hop flavor from over dry hopping is a pet peeve of mine so I always make sure to limit the amount of hops or the time that the hops are in contact with the beer when dry hopping.

### **WHAT ARE SOME OF YOUR FAVORITE AUSTRALIAN HOPS?**

**John:** We have used many Australian hops over the years. Galaxy™ is an all-time fave. Vic Secret™ is one we have enjoyed recently with a tropical fruity flavor and just a touch of dankness. Eclipse® is the newest of them I think. It came out last year with an awesome mandarin flavor and aroma.

### **WHAT CAN YOU TELL US ABOUT THE POPULARITY OF THE AUSTRALIAN BREWING INVENTION BREW-IN-A-BAG (BIAB)?**

**Rowan:** The brew-in-a-bag method was a big development from some innovative Aussies and was how I first started when I got into all-grain brewing. BIAB definitely helped simplify the brewing process and cut down the cost of equipment required to get into brewing for new brewers. It still is a popular brewing method in Australia and I think it has really paved the way for the all-in-one systems that are flooding the market now, which essentially work in the same way but with a metal malt pipe instead of the bag.

**John:** While it is true to say that BIAB is an Australian brewing invention, it is important to understand that we all stand on the shoulders of others. Homebrewers in the UK and elsewhere were mashing grains in a fabric bag in a pot to make wort for years beforehand. The thing that people like Patrick Hollingdale and the crowd on the AussieHomeBrewer internet forum did was to package, describe, and document the process to make it truly accessible to brewers wanting to move into all-grain brewing.

Fundamentally, it is a single-vessel, full-volume mashing technique that requires minimally a big pot, a bag made of resilient porous fabric (originally a curtain material called Swiss Voile, but any polyester-based fabric will do) and a heat source. You both mash the grain and boil the sweet liquor in the same pot. When you pair the BIAB technique with another process called no-chill, where you hot-pack the wort into a HDPE cube and let it cool down naturally, you have a very simple and effective way to make wort ready to

pitch yeast into.

Patrick (now deceased) really got the ball rolling on BIAB in 2005–2006. One of our customers was an early adopter of the combined technique and he would rant about it whenever he came in. He was making quite passable beers with it and opened our eyes to the concept. Before long, (Grain and Grape staffers) Geoff Hammond and Dan Walker were running regular BIAB/no-chill demos in front of good crowds out the back of the shop and we have ever since, right up to when the Coronavirus pandemic messed everything up.

### **WHAT IS THE HOMEBREW CLUB SCENE LIKE IN AUSTRALIA?**

**Rowan:** Homebrewing clubs have taken an interesting progression from face-to-face meetings at the dawn of homebrewing, to internet forums, to social media-based groups, and now a mix of them all. In Australia we have a number of great clubs who get together, share their beer, plan joint brew days, and generally have a good time. The amount of information that can be learned from trawling through online groups and pages is astounding and in general people are more than happy to help with any questions or queries.

**John:** I'm not a member of any clubs at the moment. I was involved in the beginnings of two of the original clubs in Melbourne and still support them through the business. The scene in Melbourne is very strong though.

A few of my staff are keen club members and we always support competitions and are a sponsor and drop-off point for competition entries for club, state, and the national competition. I have been involved in the Australian National Homebrewing Conference. We have run conferences every second year since 2008. We've had a range of speakers from the pro and amateur brewing world from Australia, New Zealand, the U.S., and Europe.

### **HOW CLOSELY DO PRO BREWERS REFLECT HOMEBREWERS IN AUSTRALIA?**

**Rowan:** An interesting phenomenon is the symbiotic nature of the relationship between commercial brewers and homebrewers. Many great styles were born out of homebrewers playing with new ingredients and equipment in their garages and are now big players in the world of commercial beer. On the flip side of that, the need for commercial brewers to stay ahead of the trends and keep breaking boundaries has provided us with new styles and ideas for homebrewers to try to emulate. Personally, any beer I try or idea I hear that sparks interest I am going to try brewing for myself, and I think that is pretty universal for homebrewers.

**John:** We see plenty of homebrewers who like to emulate professional craft brews they tried at the brewery or local pub, and a strong cohort like to brew strictly to style.

Most of the professional craft brewers I can think of started out brewing at home. Many of them still do, playing with new ingredients or flavor combinations before scaling them up for their clients. I don't think too many Australian craft brewers would mind me saying that to some degree, homebrewers lead and pro brewers follow.

# Hawkers' West Coast IPA clone

(5 gallons/19 L, all-grain)  
OG = 1.065 FG = 1.010  
IBU = 65 SRM = 6 ABV = 7.2%



### INGREDIENTS

9.9 lbs. (4.5 kg) North American pale ale malt  
2.7 lbs. (1.2 kg) Golden Promise pale ale malt  
0.3 lb. (0.14 kg) light Munich malt  
0.3 lb. (0.14 kg) Weyermann Carafoam® malt  
2.4 AAU Simcoe® hops (60 min.)  
(0.18 oz./5 g at 13.2% alpha acids)  
13.2 AAU Simcoe® hops (0 min.)  
(1 oz./28 g at 13.2% alpha acids)  
11.3 AAU Mosaic® hops (0 min.)  
(1 oz./28 g at 11.3% alpha acids)  
13 AAU Southern Cross hops (0 min.)  
(1 oz./28 g at 13% alpha acids)  
2.7 oz. (76 g) Simcoe® hops (dry hop)  
2.7 oz. (76 g) Mosaic® hops (dry hop)  
1.4 oz. (40 g) Galaxy™ hops (dry hop)  
½ Whirlfloc tablet (10 min.)  
½ tsp. yeast nutrient (10 min.)  
SafAle US-05, Wyeast 1056 (American Ale), or White Labs WLP001 (California Ale) yeast  
¾ cup corn sugar (if priming)

### STEP BY STEP

Use soft or low mineral content water to help accentuate the malty aspects of this beer. With a 1.5 qts./lb. (3.1 L/kg) water-to-grist ratio, target a mash temperature of 147 °F (64 °C). Perform a single infusion mash for 60 minutes or until proper enzymatic conversion has occurred. Sparge with 170 °F (76 °C) water to collect 6.5 gallons (24.6 L) of wort.

Boil for 60 minutes, adding hops and fining agents as indicated. At flameout, add the hops then give the wort a long stir to create a whirlpool and let settle. After about 20 minutes chill the wort to 70 °F (21 °C) and transfer to the primary fermenter. Aerate thoroughly and pitch plenty of

healthy yeast. Ferment at 70 °F (21 °C) until reaching a gravity of 1.024 and then allow temperature to rise to 75 °F (24 °C) until terminal gravity of 1.010 is reached, usually within 7 to 10 days.

Transfer off dead yeast/trub and add dry hops. After 48 hours drop beer temperature to 33 °F (1 °C) and lager for a minimum of 5 days. Keg or bottle, targeting 2.6 volumes of CO<sub>2</sub>.

(5 gallons/19 L, extract with grains)  
OG = 1.065 FG = 1.010  
IBU = 65 SRM = 6 ABV = 7.2%



### INGREDIENTS

6.6 lbs. (3 kg) Maris Otter liquid malt extract  
0.3 lb. (0.14 kg) Weyermann Carafoam® malt  
1.8 lbs. (0.82 kg) cane sugar  
2.4 AAU Simcoe® hops (60 min.)  
(0.18 oz./5 g at 13.2% alpha acids)  
13.2 AAU Simcoe® hops (0 min.)  
(1 oz./28 g at 13.2% alpha acids)  
11.3 AAU Mosaic® hops (0 min.)  
(1 oz./28 g at 11.3% alpha acids)  
13 AAU Southern Cross hops (0 min.)  
(1 oz./28 g at 13% alpha acids)  
2.7 oz. (76 g) Simcoe® hops (dry hop)  
2.7 oz. (76 g) Mosaic® hops (dry hop)  
1.4 oz. (40 g) Galaxy™ hops (dry hop)  
½ Whirlfloc tablet (10 min.)  
½ tsp. yeast nutrient (10 min.)  
SafAle US-05, Wyeast 1056 (American Ale), or White Labs WLP001 (California Ale) yeast  
¾ cup corn sugar (if priming)

### STEP BY STEP

You could try to do a partial mash and use some of the pale ale and light Munich malt, but with this recipe we opted to start with Maris Otter liquid malt extract and make sure the beer will properly dry out by adding 20% cane sugar.



Starting with 4 gallons (15 L) of soft brewing water, steep the crushed grains as the temperature warms up to 165 °F (74 °C). Remove from heat and add the liquid malt extract. Return to heat once the extract is fully dissolved. Boil for 60 minutes, adding hops, yeast nutrients, and fining agents as indicated (do not skip yeast nutrients!). At flameout, add the hops and sugar, then give the wort a long stir to create a whirlpool and let settle. After about 20 minutes chill the wort to 70 °F (21 °C) and transfer to the primary fermenter, then top up to 5 gallons (19 L). Aerate thoroughly and pitch plenty of healthy yeast.

Ferment at 70 °F (21 °C) until reaching a gravity of 1.024 and then allow temperature to rise to 75 °F (24 °C) until terminal gravity of 1.010 is reached, usually within 7 to 10 days.

Transfer off dead yeast/trub and add dry hops. After 48 hours drop beer temperature to 33 °F (1 °C) and lager for a minimum of 5 days. Keg or bottle, targeting 2.6 volumes of CO<sub>2</sub>.



# One Drop Brewing Co.'s Double Mango Passionfruit Sorbet clone

(7 gallons/26.5 L, all-grain)  
OG = 1.074 (pre-souring)  
FG = 1.025  
IBU = 5 ABV = 7%



A full-bodied and thick imperial smoothie style sour showcasing two of the best tropical fruits grown in Australia – mango and passion fruit.

## INGREDIENTS

3.3 lbs. (1.5 kg) American pale ale malt  
3.3 lbs. (1.5 kg) wheat malt  
1.3 lbs. (0.6 kg) flaked wheat  
1.3 lbs. (0.6 kg) malted maize  
1.3 lbs. (0.6 kg) Simpsons Golden Naked Oats® malt  
0.66 lb. (0.3 kg) Carapils® malt  
0.66 lb. (0.3 kg) acidulated malt  
5 oz. (150 g) light crystal malt  
2.2 lbs. (1 kg) dextrose (10 min.)  
½ Whirlfloc tablet (10 min.)  
5 g yeast nutrient (10 min.)  
2 sachets Lallemand WildBrew Helveticus Pitch or favorite souring strain

## Post-souring ingredients

2.2 lbs. (1 kg) lactose  
1.1 lbs. (0.5 kg) wheat dried malt extract  
0.88 oz. (25 g) Vic Secret™ hops  
8.8 lbs. (4 kg) mango puree  
8.8 lbs. (4 kg) passion fruit puree  
½ Whirlfloc tablet  
5 g yeast nutrient  
Lalbrew Voss Kveik Ale, Omega Yeast OYL061 (Voss), Imperial Yeast A43 (Loki), or The Yeast Bay WLP4045 (Sigmund's Voss Kveik) yeast

## STEP BY STEP

Please note: This recipe calls for the addition of over 2 gallons (7.6 L) of fruit puree after souring and primary, meaning you will need to account for the extra volume. This recipe uses

reverse osmosis (RO) water. Adjust all brewing water to 100 ppm each of chloride and sulfate, a high sodium level of 50 ppm minimum, and medium calcium.

This recipe uses a single infusion mash. Use enough water to target just over 1 qt. per pound of grain or 2.4 L/kg. Target a mash temperature of 149 °F (65 °C) for 60 minutes or until proper enzymatic conversion has occurred. Sparge with water no hotter than 167 °F (75 °C).

Collect enough wort for a 60-minute boil, adding dextrose, nutrient, and finings as indicated. After boil is complete, cool wort to 113 °F (45 °C). Rack into a bucket or another stock pot to get off the break material at the bottom of kettle. Pitch two sachets of *Lactobacillus helveticus*. Cover and seal kettle or bucket. Aim to maintain a temperature of 104–113 °F (40–45 °C) for 72 hours. Insulate fermenter with blankets if needed.

After 72 hours bring your kettle to a boil for 15 minutes to pasteurize. Add lactose, wheat extract, Whirlfloc, and yeast nutrient and mix thoroughly. After pasteurization step add Vic Secret™ hops and whirlpool for 20 minutes.

Rapidly chill the wort to 95 °F (35 °C) and transfer to the primary fermenter. Aerate thoroughly and pitch plenty of healthy kveik Voss yeast. Ferment at 100 °F (37.5 °C). After 36 hours ramp temperature up to 104 °F (40 °C) and add fruit purees. Spund fermenter to 15 psi if possible. After two days rouse/shake/mix fermenter to mix fruit up. Allow another five days for full fermentation to complete.

Drop to 50 °F (10 °C) and hold for five days. Then drop temperature to 32 °F (0 °C) for two days.



Keg this beer targeting 2.3 volumes of CO<sub>2</sub>. It is not recommended to bottle condition this beer due to the potential dangers caused by yeast fermenting the fruit and causing bottle bombs.

## TIPS FOR SUCCESS:

Make sure your kettle and cooling equipment is very, very clean before starting the souring process. Trust the process.

Nick says homebrewers can use rice hulls in place of malted maize if they would prefer as they act similarly, however he likes how the malted maize will contribute some extract as well.

If you can, use fresh fruit and puree with seeds/skins removed, freeze, then defrost up to room temperature. There is no need for a “kill step” as there is enough alcohol, acid, and aggressive yeast to ward off any nasties. Soft carbonation will give a creaminess. If you're feeling adventurous, keep flat and serve with a nitro tap.

# Cupitt's Estate's Eclipse

## Hazy Pale Ale clone

(5 gallons/19 L, all-grain)  
OG = 1.048 FG = 1.010  
IBU = 30 SRM = 4 ABV = 5%



### INGREDIENTS

7.8 lbs. (3.5 kg) 2-row pale malt  
1 lb. (0.45 kg) wheat malt  
1 lb. (0.45 kg) flaked oats  
0.3 lb. (136 g) acidulated malt  
3 AAU Eclipse® hops (15 min.)  
(0.17 oz./5 g at 16.5% alpha acids)  
5.5 AAU Eclipse® hops (0 min.)  
(0.33 oz./10 g at 16.5% alpha acids)  
1.33 oz. (38 g) Eclipse® hops  
(end of whirlpool)  
0.67 oz. (19 g) Eclipse® hops  
(dry hop #1)  
1.33 oz. (38 g) Eclipse® hops  
(dry hop #2)  
2 oz. (57 g) Eclipse® hops (dry hop #3)  
White Labs WLP066 (London Fog),  
Wyeast 1318 (London Ale III),  
Imperial Yeast A38 (Juice), or  
LalBrew Verdant IPA yeast

### STEP BY STEP

Aim for 3:1 calcium chloride:calcium sulfate. For this sized batch, around 6 g:2 g (8 g total) will be ballpark, but this will depend on your water supply.

The recipe employs a single infusion mash. Mash at 151 °F (66 °C) for one hour before beginning your lautering process. Collect enough wort in your brew kettle for a 60-minute boil. Boil wort for 60 minutes, adding your first hop addition after 45 minutes and the second hop addition at flameout. Give the wort a long stir then let settle for 20 minutes. Add the third hop addition then begin chilling process.

Cool wort to 66 °F (19 °C), aerate the wort well (if using a liquid yeast strain), then pitch the yeast. Ferment at 68 °F (20 °C) until the gravity reaches 1.024 and then raise the temperature to

72 °F (22 °C).

Add first dry hop addition at 30% apparent attenuation (e.g. day 2 or 3 of fermentation). When the beer nears terminal gravity, more specifically an SG of 1.012, add the second dry hop addition. Add the third dry hop addition when the fermentation is finished and clean (no diacetyl). Chill 24 to 48 hours later, depending on taste. Feel free to add more hops to last dry hop addition if aroma is lacking.

After your usual cold conditioning process, bottle/keg and carbonate to 2.7 volumes of CO<sub>2</sub>.

(5 gallons/19 L, partial mash)  
OG = 1.048 FG = 1.010  
IBU = 30 SRM = 4 ABV = 5%



### INGREDIENTS

4.33 lbs. (2 kg) extra light dried malt extract  
1 lb. (0.45 kg) wheat malt  
1 lb. (0.45 kg) flaked oats  
1 tsp. lactic acid, 88%  
3 AAU Eclipse® hops (15 min.)  
(0.17 oz./5 g at 16.5% alpha acids)  
5.5 AAU Eclipse® hops (0 min.)  
(0.33 oz./10 g at 16.5% alpha acids)  
1.33 oz. (38 g) Eclipse® hops (end of whirlpool)  
0.67 oz. (19 g) Eclipse® hops  
(dry hop #1)  
1.33 oz. (38 g) Eclipse® hops  
(dry hop #2)  
2 oz. (57 g) Eclipse® hops (dry hop #3)  
White Labs WLP066 (London Fog),  
Wyeast 1318 (London Ale III), Imperial Yeast A38 (Juice), or LalBrew Verdant IPA yeast

### STEP BY STEP

Aim for 3:1 calcium chloride:calcium



sulfate. For this sized batch, around 6 g:2 g (8 g total) will be ballpark, but this will depend on your water supply.

Place the crushed wheat malt and flaked oats in a large muslin bag and submerge in 3 qts. (2.8 L) of your brewing water. Try to maintain a mash temperature of 151 °F (66 °C) and hold for 45 minutes. Place grain back in large colander and wash with 1 gallon (4 L) of hot water. Top off kettle to 3 gallons (11.5 L) and stir in the lactic acid and dried malt extract. Once extract is fully dissolved bring wort up to a boil. Boil wort for 15 minutes, adding your first hop addition at the start of the boil and the second hop addition at flameout. Give the wort a long stir then let settle for 20 minutes. Add the third hop addition then begin chilling process.

Cool wort to 66 °F (19 °C), top up to 5 gallons (19 L), aerate the wort well (if using a liquid yeast strain), then pitch the yeast.

Follow the fermentation, dry hopping, and packaging instructions in the all-grain recipe.





Nick Calder-Scholes is pushing style limits with his beers at One Drop Brewing in Sydney, Australia.

passion fruit, without any harshness. Galaxy™ we will use on the hot side in the kettle, but prefer Vic Secret™ for dry hopping.”

A couple of other hops One Drop likes to use a lot that haven't caught on to the same degree worldwide are Astra™ and Melba™, which they source

from the state of Victoria.

“I love the characters of sweet tropical fruit flavors and New World characteristics in Astra™ and Melba™’s clean spicy bitterness with aromas of passion fruit, grapefruit, and citrus.”

Calder-Scholes says Eclipse®, released last season, is a new Aussie hop

that he really likes and there are a few others in the breeding pipeline that he's heard great things about.

In addition to these styles, One Drop has a budding barrel program featuring a range of sours, stouts, and saisons. “We use a mix of used barrels – white wine, red wine, Bourbon, Australian rum, mead, and custom saturated barrels — think Frangelico, Coca-Cola, crème de cacao.”

They've also used some pretty unusual ingredients.

“We're always exploring and evolving. We've used a range of out-there stuff. Recently, blue spirulina powder, malted milk, cascara, liquid smoke, and Shiraz grapes.”

A decade or two behind the United States, it was just within the past 10 years that the Aussie craft brew scene really began to take off. Before that, local craft brews barely existed Down Under. Today, the variety of beers being brewed, together with the passion and commitment of the brewers, has catapulted the Aussie version of this craft onto the world stage. [BYO](http://BYO.com)

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**LET'S BREW!**

Author  
John J. Palmer

**B BREWERS PUBLICATIONS**

By John J. Palmer



# 2021 Label Contest Winners

**W**ith restrictions in place for much of the past year due to the COVID-19 pandemic, people had a lot more time on their hands for activities like homebrewing, watching television, and designing homebrew labels. And if the medal-winning labels from this year's Homebrew Label Contest proved anything, it may be that many of our readers did all three! The top labels include pop culture references to music (Tyler, the Creator), animated sitcoms (*The Simpsons*), mockumentary sitcoms (*The Office*), and video games (Punch Out). They also showed off some serious artistic ability and creativity, which is what this contest — now in its 26th consecutive year running — is all about. In addition to our medal-winners, check out the Reader's Choice label and all of the Honorable Mention labels on the following pages.

As always, a huge thanks goes out to our incredible sponsors for donating prizes, and our readers who submitted hundreds of labels!



## Steve Morren HUDSONVILLE, MICHIGAN

Having brewed more than 100 beers, each with their own label, Steve has quite the experience designing homebrew labels. That experience has paid off! Judges actually went back and forth between two of his labels, either of which could have won the Grand prize. In the end, we settled on the fun Cherry Bomb label, appreciating that Steve used the cherries that paint northern Michigan red each summer for this homebrew. Everything about the Cherry Bomb label feels like it could adorn a can of craft brew, including the homebrewery logo for Outside the Box Brewing Co. We'll take one!



**Prizes:** Gift certificate from **Austin Homebrew Supply**; ZyBorg Automatic Brewing System from **Brewer's Best**; Bottle tree drainer & rinser, plus 500g each of Amarillo®, Azacca®, Centennial, & NZH-107 hops from **BSG HandCraft**; Exchilerator Brewery Wash from **Exchilerator**; SafAle yeast and looged goodies from **Fermentis by Lesaffre**; Gift card from **GrogTag**

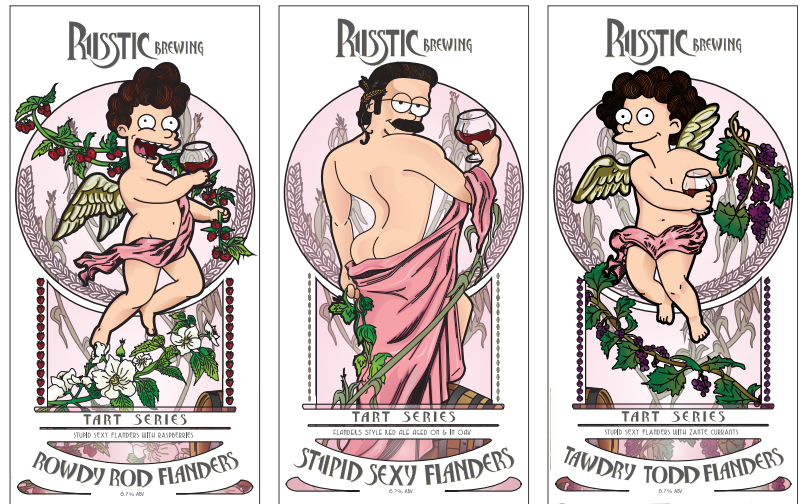




**Kelly Pearsall**  
SEATTLE, WASHINGTON

These are actually three equally great labels, but we felt responsible to share them all with our readers. “When my husband, Russell, took a crack at his first Flanders red ale, we immediately thought of the *Simpsons* quote “Stupid Sexy Flanders!” Elements of the recipe, including corn, grain, and hops decorate Flanders in the Art Nouveau style of infusing flowing flora and natural objects into the design. The image was hand drawn and then vectored in Adobe Illustrator,” says Kelly.

So why three labels? “When Stupid Sexy Flanders was removed from the 15-gallon (57-L) Bourbon barrel, 5 gallons (19 L) were then aged on raspberries, and five on zante currants. These iterations were named Ned Flanders’ two sons, Rod and Todd,” Kelly says.



**Prizes:** BrewVision® thermometer from **Blichmann Engineering**; Clear Beer Draught System with Stainless-Steel Screen Filter from **Brew Products, LLC**; Bottle tree drainer & rinser, plus 500g each of Amarillo®, Azacca®, Centennial, & NZH-107 hops from **BSG HandCraft**; Gift card from **GrogTag**; Yeast coupons and gear from **White Labs**



**Robert Holcomb**  
WYLIE, TEXAS

We’ve got a lot of fans of *The Office* in the *BYO* office, so when this label came in it got us all laughing. While the joke within the label is classic, a good joke doesn’t get you a Silver prize by itself. The color scheme, font, and simple design with Dwight Schrute’s signature tie all make this label stand out. In fact, we think the design would even make the artistic Pam Beasley proud.



**Prizes:** BrewVision® thermometer from **Blichmann Engineering**; Bottle tree drainer & rinser, plus 500g each of Amarillo®, Azacca®, Centennial, & NZH-107 hops from **BSG HandCraft**; Gift card from **GrogTag**; Yeast coupons and gear from **White Labs**



**Travis Cherry**  
FRIENDSWOOD, TEXAS

If you are a homebrewer of a certain age, then this label will surely take you back! We’ll let Travis, who has a rotating theme for his labels each year (2021 being the original Nintendo) explain exactly how much work went into creating it. “Scouring the internet trying to find photos and characters from a video game released back in 1987 proved to be a very hard and time-consuming task. Then trying to cut out each character and fit all of these on a label was also no small feat. What I ended up with though is nostalgic and takes me back to my ten-year-old self, busting King Hippo in the gut with a left jab.”



**Prizes:** Bottle tree drainer & rinser, plus 500g each of Amarillo®, Azacca®, Centennial, & NZH-107 hops from **BSG HandCraft**; Gift card from **GrogTag**; Yeast coupons and gear from **White Labs**

# Reader's Choice

## Mike Lanzafame

SPRINGFIELD, NEW JERSEY

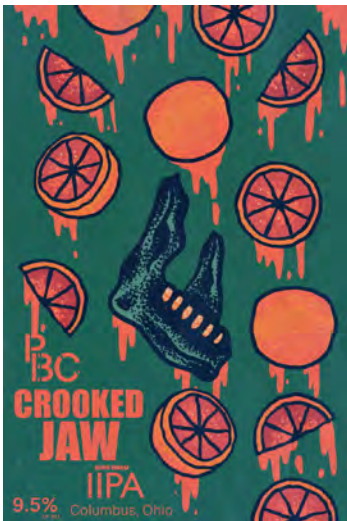
Created entirely with original art, Mike's homage to Clyde Drexler received the most "likes" in our Facebook poll among potential Reader's Choice winners. "Clyde was explosive. Clyde was dynamic. Clyde was a legend. A 10-time NBA all star, an NBA champion (sadly not with the Blazers), and an Olympic gold medalist. His ability to shoot, dish, and take it to the hole for a monster jam proved that Clyde was better than Terry Porter," Mike says.

**Prizes:** Bottle tree drainer & rinser, plus 500g each of Amarillo®, Azacca®, Centennial, & NZH-107 hops from **BSG HandCraft**; Gift card from **GrogTag**



# HONORABLE MENTION

**Honorable Mention winners receive:** Bottle tree drainer & rinser from **BSG HandCraft** (U.S. winners only); Gift card from **GrogTag**



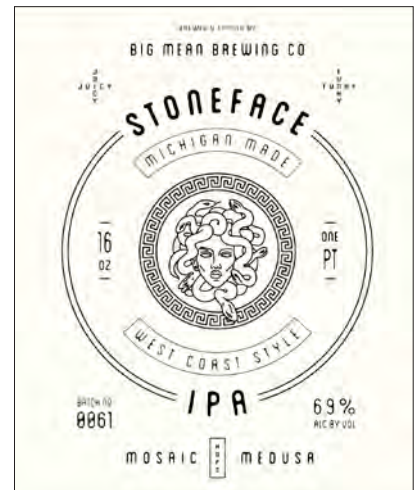
## Elias Brice

COLUMBUS, OHIO



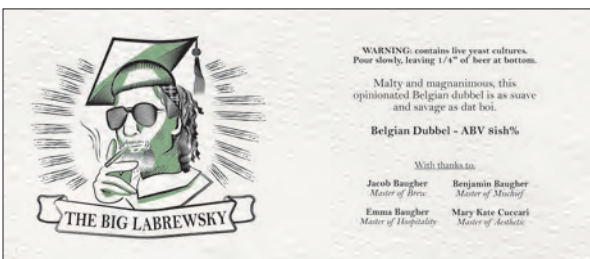
## Grant Cummings

ELMORE, OHIO



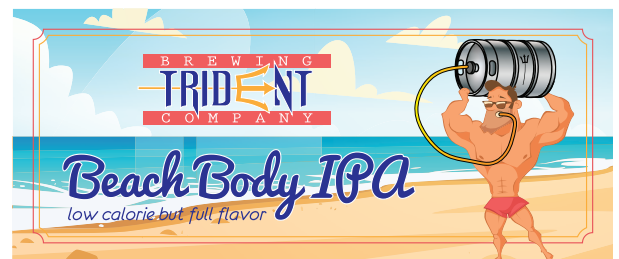
## Dexter Stevens

MARQUETTE, MICHIGAN



## Mary Kate Cuccari

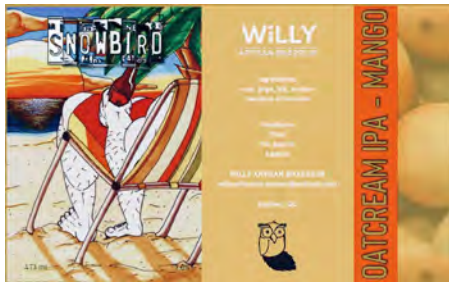
MILLVALE, PENNSYLVANIA



## Matt Ellis

FRANKENMUTH, MICHIGAN





**Martin Gagne**  
QUEBEC CITY, QUEBEC



**David Hopkins**  
WHYALLA, SOUTH AFRICA



**Mike Maas**  
PRESCOTT, ARIZONA



**Mike McGuire**  
WARREN, MICHIGAN



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VARAZDIN, CROATIA



**Artur Szudrowicz**  
OPALE, POLAND



**Aaron Gurley**  
OLATHE, KANSAS



Photo by Charles A. Parker/Images Plus



# SMOOTHIE SOURS

THE “PASTRY STOUT” OF THE SOUR BEER WORLD

by Dan Russo

**T**o think that 20 years ago the word beer and smoothie being put together in the same sentence, much less next to each other, would have been unfathomable. And here we stand in 2021 on the edge of the smoothie revolution! Brewers standing up, creating beer, and altering palates in ways that have droves of craft beer enthusiasts lining up to praise the innovation; while others scoff at the sheer thought of making beer not taste just like a “normal” beer. Whichever lane you might reside in, the simple fact is that smoothie beer is here to stay.

## THE SHORT HISTORY OF SMOOTHIE SOURS

In the early 2010s, breweries resurrected the nearly forgotten German beer styles of Berliner weisse and Gose. As these “kettle soured” beers grew in popularity brewers began expanding the styles with additions of fruit of all different types. As the styles continued to grow, brewers began pushing the limit of how fruit could be perceived in sour ales. Eventually the level of fruit being used led to a near smoothie-like character, inevitably being called smoothie sour beer. From there the use of crazy adjuncts and ingredients such as cinnamon, chocolate, ice cream, and cheesecake (just to scratch the surface on the options), no longer stood in the way. We hit a smoothie precipice that there is no coming back from.





Smoothie sours are a dessert in a glass, with no limits to the fruit and adjuncts that can be used.

## HOW TO MAKE A SMOOTHIE SOUR

Smoothie sours differ from the traditional sour beer base in the fact that you are trying to create a beer that is well attenuated, yet has a full mouthfeel. At Oakshire Brewing in Eugene, Oregon, where I am Director of Brewing Operations, we build our base on our house hazy IPA recipe, chock full of wheat and oats. A little bit of acid malt for mash pH adjustment and some dextrin malt for the INSANE foam retention that you will get from the fruit additions. We shoot for a base beer between 9.75% and 10.5% ABV. The fruit we use is unfermented and accounts for about 45–50% of the final volume of finished beer, creating a beer that is 5% ABV by the time it is packaged. You are also looking for wort that has a bunch of fermentable sugar. Shoot for a low mash temperature in the 148–149 °F (64–65 °C) range. This will help the yeast beat the acidity and high gravity at the same time.

After a very short boil (40 minutes or so) send the wort to a souring ves-

sel and add your favorite *Lactobacillus* culture for your sour beer. We have a house culture that has been running for over six years that started from live culture yogurt. It works fantastically and you only need a little to get everything going (for a 5-gallon/19-L batch I recommend ½ cup of live *Lacto* culture yogurt).

Our souring target is between 3.40 and 3.55 pH. Any lower than 3.40 and you end up with a base beer that does not interact well with the acidity of nearly any fruit; any higher than 3.55 and you start to lose the essence of the base sour beer. We're often asked about titratable acidity (TA) in relation to our smoothies, and if we use it. Currently for the smoothie sours we focus on the pH as our indicator as the analysis for all fruit we receive is measured in pH as well. We feel that we are able to better match fruits together along with our base sour by comparing the pH of the fruit to the 3.40–3.55 pH standard that we target on the base. It really is towing a very fine line. If you do not have a pH meter, go by taste. It is alright to taste the wort at this point

as it will shortly be boiled and all the *Lactobacillus* will be boiled off.

After you have reached your optimal souring point (depending on the culture this could be in 18–48 hours), bring the wort back to your kettle and begin to boil. A short 40-minute boil works great for these beers. The kettle additions are simple: Dextrose (corn sugar), yeast nutrient, and whirlfloc. You want to incorporate dextrose as approximately 9–10% of your total fermentable sugars. The goal is to have a beer out of the kettle at 1.097–1.100 specific gravity (SG). After fermentation you'll have the 10-ish% ABV that you are looking for.

## FERMENTATION AND THE ROAD TO ADJUNCTS

Make sure that your wort is thoroughly aerated with oxygen. We are aerating with oxygen at a rate of 9–10 liters per minute. The finished beer will need it, as the fermentation will be tough on the yeast with such a high original gravity (OG) and low pH. The target final gravity (FG) is between 1.020 and 1.024 SG. My preferred yeast is Imperial Yeast Flagship (A07), also known as the “Chico strain.” It can absolutely withstand the high gravity and low pH and achieve the desired fermentation metrics. If you have fermentation controls, I recommend running it at 68 °F (20 °C) to start with a bump to 70 °F (21 °C) after two days. If you are running it at ambient temperature just let it ride; it really won't hurt the fermentation or final beer. Terminal gravity is usually achieved in about 10 days as the yeast works through the sugar and pH.

## THE WORLD OF ADJUNCTS

Adjuncts are the meat and bones of smoothie sour beers; however, do not undervalue the importance of your base beer. No amount of extra ingredients will cover flaws of brewing execution and fermentation. That being said, damn are the adjuncts fun.

Once you have reached terminal gravity it is time to start thinking about your fruit and other adjunct additions. To really create a smoothie sour beer your fruit is not meant to be re-fermented. It needs to stay



in the full puree state to really get the smoothie feel to encapsulate the drinking experience. If you are simply going to add fruit, the recommendation would be to crash the beer down to 34 °F (1 °C) and transfer off the yeast cake to secondary conditioning to allow more yeast to settle. After another 4–5 days cold, rack the beer off the yeast cake to fruit!

With your first smoothie sours I would suggest going a simpler route and starting with just using fruits, while holding off on the adjuncts. I know the temptation of jumping into using extreme ingredients when you see other brewers using them in the style, but if you don't first master the fruit, then every other addition is fruitless. The simplest introduction to fruit that can be given is to go with fruit and fruit combinations that you know. Don't start out attempting to overcomplicate your approach. Using 100% raspberries or blueberries will turn out to be absolutely fantastic. If you feel a tad more adventurous go with known fruit combinations. One of my all-time favorites is POG (passion fruit, orange, guava).

The selection of how the fruit is prepared is important. Fresh fruit is not advisable for smoothie sours as there may be wild yeast on the skins that will cause refermentation. The ideal fruit is aseptic puree found in almost every grocery store.

What, wait, you don't use freshly picked fruit!?

We don't, the honest truth. Aseptic fruit puree has a very long shelf life and the right brands add no additional ingredients or preservatives. Oregon Fruit Products makes some of the absolute best, and is available in grocery and homebrew stores all over the country with a wide variety of fruits. There are some other awesome brands out there as well. As you look to find the one that is best for your smoothie beer make sure it is 100% fruit, no preservative aseptic puree and you can't go wrong.

When you have the fruit additions down and become more curious and adventurous with your adjunct usage there are a few extra steps that are necessary to really bring out the

full flavor of all the adjuncts. After fermentation is done and you see a steady FG for three days straight, let the beer hang on for another four days at fermentation temperature. Do not cool or crash the beer. This is going to be integral to the pick up of flavor from your secondary conditioning. As you have carefully selected your adjunct additions; place them in your secondary vessel, and if you have the ability then purge the vessel with CO<sub>2</sub>. Transfer your base beer onto the adjuncts for 5–7 days. For nearly every adjunct you use this will end up being the perfect amount of time. It allows for the complete absorption of the flavors, without those characteristics becoming overbearing on the base beer. I've found that only certain adjuncts can be detrimental to your beer out of the gate if left for too much time. Mainly be careful with spices such as cinnamon, nutmeg, and allspice. Use too much for too long and you have a recipe for disaster. After your 5–7 days you are ready to follow the pre-

viously mentioned steps and head to fruit additions.

## PACKAGING

Once your newly created smoothie sour is near ready to drink, it's time to consider how it will be conditioned and poured. The first and easiest choice would be to condition in a Corny keg. If you are going the kegging route, I recommend adding the fruit puree to the keg and racking the beer on top of it. Once racked and in your kegerator you can begin conditioning. The main point to consider is separation. During conditioning and pouring you will want to make sure you are always shaking the kegs to keep everything mixed. As for carbonation there is no exact standard for when it is carbonated. It is really up to personal preference. You can have near zero carbonation or make it extremely carbonated (though it won't look or taste it, due to the thickness). It's really based on personal preference — bubbles or no bubbles. I personally like a good



Oakshire Brewing has released dozens of smoothie sours in the last two years featuring crazy ingredient combinations. New releases are among the most anticipated and sought-after beers they produce.

Photo courtesy of Oakshire Brewing



amount of carbonation in these beers. The puree forms a crazy foam head that holds on the entire time you have a smoothie beer in your glass. I think it's pretty great to explore. Either way, be sure to keep the keg cold at all times after kegging.

Bottling these smoothie beers is a completely different story. There will be no bottle conditioning as the yeast will rip through the fruit and cause literal bottle bombs (really, please don't attempt to bottle this way). The best way would be to carbonate in a Corny with the aforementioned technique and bottle off the Corny.

### USING WEIRD AND WACKY ADJUNCTS

There really is no limit to the adjuncts that you can put into these beers. That said, here are my favorites:

**Marshmallow:** Marshmallow has become a staple in Oakshire's smoothie sour program. We solely use marshmallow creme, or Fluff as many may know it. We use about 3 lbs./gallon (360 g/L) of Fluff in the base beer before we add fruit. Combined with vanilla you end up with a silky and creamy texture to balance out any tartness from the fruit. Going to the grocery store and buying the real stuff is the way to go. Really a game changer. Add between primary fermentation and secondary conditioning when the beer is still warm. After the 5–7 days you can transfer to fruit. Do note that marshmallow fluff is not vegan as it contains egg whites.

**Vanilla:** The second staple to our smoothie sour base; vanilla beans help to amplify the creaminess. The marshmallow Fluff draws all the taste in and the beans help to round everything out. My ideal usage rate is one bean per gallon (4 L) of finished beer (with fruit). I would add it during secondary conditioning and before fruit for the full effect.

**Cinnamon:** The quintessential ingredient for making pastry-style cake smoothie sours (yeah, it really is a thing). It can be over the top if used in excess. Start with less and slowly add cinnamon until you reach the level that is right for your taste. Too much and you can easily render the beer undrinkable. Add it in secondary first and when you transfer to fruit see how you feel. Maybe you can add a little more, but don't overdo it.

**Soft-Serve Ice Cream Mix:** It may sound crazy but hear me out. This stuff is awesome for adding a ton of flavor and texture. It makes the beer super, super thick. It's almost a milkshake more than a smoothie. There are so many flavors as well and a lot are non-dairy. We've explored vanilla and chocolate so far, but I have my eye on pistachio! We use about 2 lbs. per gallon (240 g/L) of finished beer. All you need to do is blend it up with a little hot water until dissolved and put it at the bottom of your finishing vessel with the fruit before racking. Once

## BREW YOUR OWN SMOOTHIE SOUR

Because most of these beers have the same ingredients except for the fruit and adjuncts, it seems easiest to start with the base recipe that we use for every batch and then talk about some of the potential flavor combinations we have used vs. writing out individual recipes. Shoot for an OG of 1.097–1.100 and an FG of 1.020–1.024 and a souring target of 3.40–3.55 pH.

### Grist Bill

- 2-row malt (55%)
- Malted white wheat (14%)
- Dextrin malt (7%)
- Acidulated malt (3%)
- Rolled oats (12%)
- Dextrose (boil) (9%)

### Mash Temperature:

- 148–149 °F (64–65 °C)

### Mash Additions:

- Calcium chloride and calcium sulfate (gypsum)

### My Favorite Fruit &

#### Adjunct Additions:

**Pineapple Dreamsicle:** A journey down memory lane. Everyone remembers dreamsicles (or creamsicles).

Orange and vanilla all packed into a cold, delicious treat. I like to take that memory to the next level with secondary fruit and marshmallow additions to really amplify the feel. My favorite iteration incorporates the addition of pineapple puree.

### Lemon Blackberry Cinnamon Roll

**Cheesecake:** Probably one of the most ambitious smoothie beers that we have attempted, but also one of the most delicious. Starting with our smoothie sour base we add cinnamon, vanilla, marshmallow, and graham cracker. The beer is then finished on  $\frac{1}{4}$  lemon puree (careful of the tartness level) to  $\frac{3}{4}$  blackberry puree and a lot of cheesecake mix. This beer is a freaking trip.

**Strawberry Ice Cream:** Straight up strawberries and cream. Same base with vanilla and marshmallow, but the non-dairy, soft-serve ice cream mix adds this next level of depth and complexity. We brewed this originally with our friends at Urban South-HTX and the ice cream treatment has become a staple of our program since.




you are done give it a big shake to mix everything in and you are good to go!

**Cheesecake Mix:** Probably the wildest and one of the most delicious ingredients that I have added to a smoothie sour beer. In the same process as the ice cream mix, we utilize New York-style, no-bake cheesecake mix available at almost any grocer or online. A little hot water before transferring onto beer and fruit and shake it up. You literally have a melted cheesecake in a glass. It is a trip!

**Coconut:** One of my favorites for so many beers, smoothie or not. My preferred blend is  $\frac{2}{3}$  unsweetened toasted coconut to  $\frac{1}{3}$  raw, dried, unsweetened coconut at a rate of 20 lbs. per BBL (0.65 lb./gallon or 78 g/L). Premade toasted coconut can get pricey at about \$7/lb. when purchased online, but it is the easy way. You can always make it yourself at home. Start with raw, unsweetened coconut flakes and preheat your oven to 325 °F (163 °C). Spread the flakes out thinly on a baking sheet and bake for approximately five minutes, or until they begin to slightly brown. Pull out to stir and flip the coconut flakes on the sheet to ensure even browning. Place back in the oven for about another five minutes or until golden brown. Keep a watchful eye as they can go from brown to burnt very quickly. Pull out and remove from the baking sheet to let cool. Repeat the process until all of your coconut has been toasted.

The only thing you need to worry about is the absorption of the beer into the coconut. It will likely result in the loss of 15% of the beer, but dang does it taste good. You can easily add it to a secondary bucket and put the base beer on top of it. Drawing off the bottom will yield the most beer before you add it to fruit.

Whichever way that you end up approaching your smoothie sours, some of the aforementioned tips will help you create a successful and delicious beer. And the amazing part is there is almost no flavor that you can think of that would be out of the question. You can take these beers as far as your imagination will let you! 

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(All Times are Eastern)

## NanoCon Online Day #1 • Friday, December 3, 2021

11:00 AM – 12:00 PM	Post-Pandemic Taproom Trends	Optimizing Brewery Layout for Workflow & Space	Top 5 Legal Mistakes to Avoid as a New Brewery
12:00 – 12:30 PM	Q&A WITH NANO VENDORS		
12:30 – 1:30 PM	Hazy Brewing Case Studies	Planning a Brewery Quality Control Program	Brewery Metrics & Key Performance Indicators
1:30 – 2:15 PM	NANO CRAFT BREWING TRENDS PANEL		
2:15 – 3:15 PM	Breaking Down the Numbers on Taproom-Focused Breweries	Finding & Keeping Staff	Evaluating your Malt
3:15 – 3:45 PM	Q&A WITH NANO VENDORS		
3:45 – 4:45 PM	Relaunching Taproom Events Panel	Taproom Draught System Troubleshooting & Maintenance	Nano Tank: Pitches to Expert Panel
4:45 – 5:15 PM	Q&A WITH NANO VENDORS		

## NanoCon Online Day #2 • Saturday, December 4, 2021

11:00 AM – 12:00 PM	Enzymes, Nutrition & Brewing Process Aids	5 Steps to Taproom Success from Day One	Financing a Brewery Expansion
12:00 – 12:30 PM	Q&A WITH NANO VENDORS		
12:30 – 1:30 PM	Keys to a Better Nano Business Plan	Turning Social Posts into Sales	Hard Seltzer Production for Nanos
1:30 – 2:15 PM	NANO BUSINESS TRENDS PANEL		
2:15 – 3:15 PM	Intellectual Property Strategies for Breweries	Starting Up a Sensory Panel	Brewery Branding 101
3:15 – 3:45 PM	Q&A WITH NANO VENDORS		
3:45 – 4:45 PM	Equipment Planning for Expansion	Planning your Taproom Draught System	Membership Programs to Boost Loyalty & Revenue
4:45 – 5:15 PM	Q&A WITH NANO VENDORS		

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Remember, the only numbers that are good are numbers you can trust.



Regularly scheduling a calibration of your brewing equipment will ensure confidence in the measurements.

don't think anyone will be surprised if we point out that homebrewers are a diverse group. We like different styles of beer, have different ways of brewing, and different goals for our hobby. But one thing I think we can agree on is that homebrewers love their gear. We may not all have the same gear or feel the same about what's necessary, but whatever we use we're totally into it!

Another thing that we can agree on is that gear that doesn't work properly is worse than no gear at all. One thing you can do to ensure that your equipment does what it's supposed to do is to be certain that it's calibrated correctly. So, we're going to look at what a homebrewer might have around and how to be sure it will be accurate to help you make your best beer.

Remember, the only numbers that are good are numbers you can trust. What good is it thinking your wort is 1.050 SG if it turns out your hydrometer reading is off? The only person in a worse position is the brewer with two uncalibrated instruments – you'll never know which is right. Fortunately, calibration – at our need level – is relatively painless.

Keep in mind that we're more concerned with accuracy than precision. Precision would be "How many decimal places your hydrometer shows" and for homebrewing is of limited value. Accuracy is knowing the value you're reading is correct. Brewers want accuracy from their equipment – that the hydrometer shows what the real story is.

### THERMOMETER

If there's one piece of equipment that's common to all homebrewers, it's a thermometer. You use it at multiple points in your brew and fermentation over a wide range of temperatures. A thermometer that's out of calibration can leave you mashing or pitching yeast at

the wrong temperature with potentially disastrous results to your beer.

Will your beer not beer? No, remember brewers used to brew and get away with it back before the thermometer. Amazing to think that both of our primary tools for brewing – the thermometer and the hydrometer/saccharometer both came into brewing usage in the 1700s. Just think how much beer was brewed before then!

As with any calibration, you need a standard to check it against. After all, how can you know you're measuring something correctly, if you don't know what it's supposed to be measuring? The easy way to provide a known, thermally speaking, is to use ice water and boiling water to check the calibration at the extremes. Crush enough ice to almost fill a small glass, then cover the ice with water. Give it a good stir and wait a couple minutes, then take the temperature. It should be 32 °F (0 °C) or darn close to it.

At the other end, you can boil some water. But remember that the temperature for boiling water changes depending on your elevation above sea level (ultimately it's the air pressure). You will need to account for that.

There are a couple problems with this method, though (aren't there always?). First, you have to account for your altitude. More confounding, we've seen thermometers that were correct at the extremes but off at mash temperature. Unless you mash at freezing or boiling temperatures (we don't!), you might have problems. A more accurate method is to check the calibration near the center of the scale, closer to the temperatures you'll actually be using.

So, you'll need to compare the thermometer under examination to a thermometer that you trust. An alcohol lab thermometer that is designed for



calibration is one choice. A good digital thermometer (we both like the Thermapen and VWR also makes some very good ones) is another. Whichever you use, be sure it's NIST (National Institute of Standards and Technology) certified.

If you're using an alcohol scale thermometer for brewing, about all you can do is note the difference between it and your calibration standard and hope it's constant over your thermometer's range.

If you're using a bimetal dial thermometer, you can turn the nut behind the dial face to calibrate it. Denny has been using one like this for 25 years, and finds that as long as he doesn't drop it (good luck on that) it holds the calibration pretty well. And it's quick and easy to recalibrate when it's off.

Of course, if you buy a Thermapen for calibration, you could just use that instead. That's what we've both decided is the best way for us. It's accurate, fast, and reads at the tip of the probe so you don't need to insert it far to measure something. And if you're into cooking, it's a must have so your money goes even farther. (Drew here – I swear by my Thermapen. They're not inexpensive but they're well worth the cost and there are some more inexpensive makes that are "pretty good" like the Lavatools Javelin.)

## HYDROMETER

Of course, unless you're a free-spirited brewer (or sometimes forgetful like Drew), you want to know how strong your beer is and that's where the hydrometer comes in. To check the calibration of your hydrometer, fill your sample flask with distilled water. Float your hydrometer in it, making sure that it isn't touching the bottom or sides of your sample flask. You also need to ascertain the temperature at which your hydrometer was designed to be read. Use your newly calibrated thermometer to check the temperature. The hydrometer should read 1.000 in distilled water at the proper temperature.

Much like the thermometer, we do have to worry about measuring at scales. Reading 1.000 at temperature in distilled water is a good guide. One pound (0.45 kg) of corn sugar (dextrose) reliably gives you a gravity of 1.042 when dissolved into a gallon of water. So, dissolve 113 grams of sugar into 946 grams of water and then measure your resulting gravity. It should read around 1.042.

You can also use an NIST-certified laboratory hydrometer to compare against. (Protect those at all cost.)

Now what if your hydrometer is wrong? This is not uncommon with cheap hydrometers. You have two choices – add a note to the hydrometer tube saying ("Add 4 points at 65 °F/18 °C" and hope it's linear). Alternatively you chuck it and buy a new one, but this time shell out a few more dollars for a quality one.

We both prefer to use a hydrometer with a thermometer and temperature correction scale built into it. It makes for an easy one-step reading. You can also get hydrometers that are calibrated at 155 °F (68 °C), which is in the mash temperature range. Brewing America is one vendor that sells both of those.

## REFRACTOMETER

Refractometers have automatic temperature correction (ATC),

but many homebrewers don't realize that's to correct for the temperature of the instrument, not the sample. The small sample you use quickly gets to the same temperature as the refractometer. Still, it's best to avoid extremely hot or cold instrument temperatures when calibrating.

Put a drop of distilled water on the slide of an analog refractometer and close the cover. Point it toward a light and read the scale. It should read 0. If it doesn't, turn the adjustment screw until it does.

Denny and Drew both use digital refractometers to measure our wort. The process is similar. If you use a digital refractometer, follow the manufacturer's directions for best results (usually it's just pressing a button).

And never forget – a refractometer is wonderfully intuitive for measuring wort gravity, but the scale goes off kilter when you measure beer. You can either use a hydrometer like Denny to measure beer gravity or use math like Drew often does to correct for the influence alcohol has on a refractometer reading. <https://www.brewersfriend.com/refractometer-calculator/>

## KETTLE

Knowing the volume of liquid in your kettle is crucial to calculating your efficiency or knowing when our boil is done. You'll need to start by having an accurate way to measure the water.

Water weighs approximately 8.34 lbs. (3.785 kg) per gallon (metrics are a heck of lot easier here since 1 L = 1 kg). You can put your kettle on a scale as you add water to it, but that can be difficult. Denny uses a plastic ½-gallon pitcher. He puts that smaller container on a scale and adds 2.085 lbs. of room-temperature water to it (or 2 lbs. and about 1½ oz.). That's a quart. Pour it in your kettle being careful not to spill.

You can mark your kettle directly by using a screwdriver or engraving tool to scratch marks on it. Denny prefers to mark a wooden paddle that he sticks into the kettle. Add a qt. of water to the kettle then insert the paddle (stick, rod, whatever) to the bottom of the kettle. Pull it out and mark the waterline with a permanent marker. Repeat, adding another quart at a time, until you've filled the kettle. Of course, if you need less precision, you can add more water at a time. Just be sure to measure carefully.

And if you're bizarre, like Drew, you can use math! After doing some of the above to confirm the basic math, he set up a spreadsheet with a simple cylinder equation that means he can measure with a yardstick and input the number and find out his volume with decimal precision. Of course this is an extra step, but Drew's like that.

## FERMENTER

Calibrating a fermenter is a lot like calibrating your kettle. But the marking is different. If you use buckets, or any kind of plastic fermenter where the liquid level is visible from the outside, you can use a permanent marker to mark the level of each water addition.

You can also use a marker on glass carboys, but you'll have to remark them occasionally as the marks wear off. Still, they last quite a while and they're fast and easy to remark if you get to it before they're completely gone. A more permanent way is

# TECHNIQUES

to etch the carboy with volume marks. A description of how to do that can be found in multiple places on the internet. (But be careful! Don't etch too much and weaken your glass.)

Stainless steel conical fermenters usually come with marking already on them, but don't assume. Check before purchase so you'll know what you've got.

## SCALES

You'll need to be able to weigh something of a known weight to calibrate your scales. For small amounts you can use coins. A penny weighs 2.5 grams and a nickel is 5 grams. If you have other coins, you can look on the internet to ascertain their weight.

For larger amounts, you can rely on the old saw "a pint is a pound the whole world round." Put a container on your scale, tare out the weight, then add 16 oz. of water to it. It should weigh one pound. (Note: Some sources say that 15.34 fl. oz. equals one pound. Close enough for homebrew!)

## GRAIN MILL

We strongly feel that it's pretty much impossible to designate a single, all around gap that will be perfect for everyone. The right mill gap for you will depend on the grain you use, as well as your brewing equipment and techniques. The important thing to do is to experiment until you find what's right for you and then how to measure and document it so you can return to that gap if you should lose it.


Once you have your mill set to where you want it, use

automotive feeler gauges to measure it regularly. Some people use a credit card, and if that's the right gap for you then it's an easy method.

## pH METER

In order to calibrate a pH meter, you'll need to obtain calibration solution. It can be a powder you mix with distilled water, but we both prefer the ease and precision of pre-mixed solutions. You'll need a 4.01 and 7.01 (often referred to as 4 and 7). While you're at it, pick up some pH 10 storage solution. While you won't need it for calibration, it's best to store your meter with the probe in storage solution. It will extend the life of your meter. Like refractometers, pH meters generally have some sort of ATC, but it's still best to calibrate close to room temperature.

Start by rinsing your meter's probe, preferably with distilled water. Then immerse the probe in the 4.01 solution. Either adjust manually or, if you have a meter with automatic adjustment, wait until the meter tells you it's calibrated. Then rinse the probe again and repeat the process with the 7.01 solution. We like to rinse the probe again and go back to the 4.01 to be sure the calibration held. Then another rinse and back to the 7.01. Rinse and repeat until you get good readings of both with further adjustment.

The only thing more annoying than out-of-calibration equipment is screwing up a brew because your measuring tools weren't calibrated. Make sure you know your gear is giving you accurate readings. 






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# FAUCET DESIGNS

## From functional to fancy

**P**ouring your own beer from your own draft system is cooler than the other side of the pillow. If you are enjoying a homebrew wouldn't you be enjoying it so much more if it were dispensed from a beautiful and glorious kegerator? Of course! Lucky for us, *BYO* magazine has numerous articles describing how to set up and troubleshoot draft beer dispensing. If you are thinking of taking the plunge, do some browsing. Of all the planning, expense, and parts that make up a draft system, only one item has what the software people call a user interface. The faucet is the link to a well-poured beer. There is a certain satisfaction to the feel of a machined hunk of steel. The same feeling you experience when you close the door of a Cadillac, or perhaps a bank vault. Only better because you are pouring beer. My business partner and I have many years of experience designing, installing, and maintaining draft systems. We have no financial interest in any of the products mentioned; just the real dirt. So if you have a draft system, or plan to, let's get nerdy with beer faucets.

First, please don't call it a tap. Well, do as you like, but if you want to be a cool draft nerd (don't we all?) and impress your friends with your awesome beer knowledge, you should know the difference. Taps go into a keg. Faucets pour beer. Tapping a faucet with a mallet into a wooden keg was once a thing, but it is pure nostalgia now. Don't sweat it too much. Tap or faucet, there is a technical difference.

Considering the rather simple task a faucet accomplishes, there are an awful lot of options. If it does not leak when closed and pours beer when open that should be it. Of course, every manufacturer is determined to offer the perfect product for your budget and we are blessed (cursed?) with many options. We are going to explore a few varieties,

discuss materials, and get you to where you know more about beer faucets than the next brewer. Faucets are surprisingly fun, in a beer nerd sort of way.

### FAUCET MATERIAL

There are two materials to choose from: Stainless steel and everything else. In my opinion you want stainless. I'll be blunt and just state that saving \$10 or even \$20 in anything that's not stainless is foolish. Folks, there is some astonishingly low-quality hardware out there. If it looks suspect, stay away. The "everything else" category includes chrome-plated brass or heaven forbid, plastic. Once that chrome wears away, and it will, you have a brass faucet. This is problematic because brass is not food-safe (this is in the U.S. Food and Drug Administration/FDA's Food Code, item 4-101.14 if you are curious). Expect the inside of the faucet to corrode well before the outside. With cleaning chemicals and beer flow, your chrome faucet will sooner or later be a brass faucet. Now when you see the old-timey brass faucet at the local water hole, you'll know better. As for plastic, what can be said about plastic hardware? Point being, here is not the place to save a few bucks.

Maybe shiny stainless steel is not to your liking. Then you should look into physical vapor deposition (PVD)-coated stainless steel. These are stainless product with a gold, brass, or some other color appearance and are much more durable than chrome. If you already have a chrome faucet, then give it an inspection. If the plating is still intact, then there is no immediate need to swap out. But when it eventually wears out replace it with the stainless faucet of your dreams. If you are not sure, look closely for signs of wear and exposed brass. A magnet will not stick to brass, 304- or 316-stainless steel. Oftentimes you just have to inspect carefully.

**Spend some time with the aesthetics of your chosen faucet because that is really the only part of the draft system you will handle regularly.**

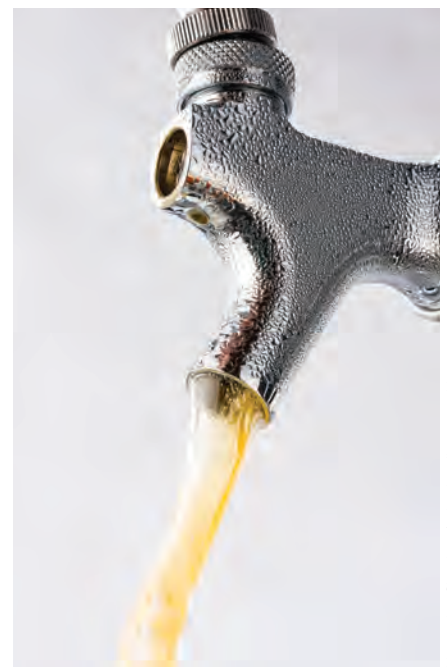


Photo by Charles A. Parker/Images Plus

# ADVANCED BREWING

One of the rules in draft beer is to use stainless steel and FDA-compliant tubing. Regarding tubing, please reference the July-August 2021 issue article covering the topic, also found at <https://byo.com/article/choosing-tubes-and-hoses/>. For faucets, I recommend budgeting between \$25 to \$50 for a quality faucet. If you are looking for something more unique, expect to pay upwards of \$100 or more. If a good faucet costs \$25 to \$50, what can you expect from a \$13 faucet? Something that needs replacing frequently is the answer to that. So which faucet should you buy? There is no one right faucet, but there are a few things to think about before you settle on anything in particular. There IS one right way to pour a beer though, which will be discussed at the end of this column.

## ANATOMY OF A STANDARD FAUCET

A beer faucet can be summarized with a few primary parts. Knowing each item is useful because it determines which faucet is right for you. The faucet body is a solid piece of metal, and everything else is attached to the body, usually threaded in place. A quality faucet will feature a well-machined body; heavy, and shiny. Lower-quality faucets have a clunky body that just doesn't look right. Spend some time with the aesthetics of your chosen faucet because that is really the only part of the draft system you will handle regularly. Name brands include Perlick, Micromatic, Intertap, CM Becker, TOF, and Abeco. There are more. It is likely you won't be handling the product until it arrives in your mailbox, so a retailer with a decent return policy is worth it. A well-machined faucet feels right. You know it when you see it.

The stem is the piece that extends from the body upwards and is threaded to accept a faucet marker, a.k.a. tap handle. It is an easy tell when you see a brass stem. A minor cost savings and not a sin but better quality faucets will have a stainless steel stem. Bonus advice: Have you ever broken a faucet while pouring a beer? It's exciting because it breaks in the open position. And the beer continues to pour until you disconnect the keg. Avoid this lunacy with a stainless steel stem. Same for the faucet shaft, which is the horizontal part that controls the flow of beer. The stem comes in contact with beer and can corrode, but you won't see it until you dismantle the faucet and inspect (which you should be doing periodically). The rest of the faucet is a bunch of washers and gaskets. Each manufacturer has their own particular standard faucet assembly and we won't get into that here.

## STANDARD (REAR-SEAL) FAUCETS

The standard beer faucet is ubiquitous. It's been around for a few decades and called standard because, well . . . for a long time it was found in most all draft systems here in the U.S. Still is. This design uses a valve and O-ring stopper to control the flow of beer. Pulling the handle forward pushes the stopper back towards the shank and the beer flows around the opening. When the handle is pushed backwards the flow of beer stops. Simple. There is a weep hole in front of the stopper and near the spout. The weep hole is there

to provide a vapor break for the beer when the faucet is opened. Pay attention to this hole as it is prone to fouling if not cleaned out occasionally. Your cleaning regimen should include inspection of the weep hole. One particular area prone to fouling is at the front of the faucet body, where the horizontal shaft protrudes into atmosphere as the faucet is opened. Because the design is soaked every time a beer is poured and the wet parts are exposed, conditions are right for the formation of beer snot. This is also an unrefrigerated part of the draft system. If you have not dismantled your faucet to do an inspection, be prepared for the horror show. A vigorous cleaning of all faucet parts is a requirement with this type of faucet. Enjoying a homebrew immediately after a cleaning is also known as a Perfect Pint. Even if it is all in your mind, it does taste better.

The standard faucet has served us well for a long time. If you find a stainless steel standard faucet that looks nice, from a reputable manufacturer, and you take the time to clean it periodically, you could do a lot worse.

## FORWARD-SEAL FAUCETS



Because the standard faucet is so good and so popular, naturally we have an alternative. The forward-seal faucet really is a genuine improvement though. This design is our favorite and accounts for roughly 90% of our installations. Basically, fewer parts means fewer parts to fail. Superb machining means better pours. Subtle but different design means unique style. The forward-sealing faucet is a really nice gadget and well worth the \$45. The design principle of the forward seal is to use a ball directly attached to the stem, eliminating the shaft and weep hole. When pulled forward the ball disengages from the O-ring seal and beer flows. In the closed position the ball sits firmly against an O-ring. The body is slightly smaller than typical, and the spout angle is a bit more pronounced, allowing the faucet to drain completely between pours. Early designs were prone to leaking but the most recent model is rock solid. We have somewhere around 700 of these faucets in service and aside from occasional user abuse, they just do not fail. Forward-seal faucets can be cleaned in place too. You do need to periodically dismantle and inspect but the frequency is much less than with a standard faucet. The sanitary advantages inherent with the forward-seal design are genuine, but no matter the faucet you do need to maintain a cleaning regimen. Fewer parts to foul does not mean the faucet is invincible. Yeast will eventually get hold and create a fairly disgusting situation. The technical term is *schmoo*.

## EUROPEAN (EURO) DESIGN

The term Euro is a bit misleading. For one, European faucets will not work on our domestic systems . . . because they're based on the metric system. And there is no one "Euro" design, it's just different than domestic. Other than that, the usual design is basically a standard faucet with an extended spout and often a bigger body as well. This spout is elegant but in practice not all that different than the usual faucet.





faucets look different and that is cool. But be prepared to pay for the distinction.

If your draft system has coffee or wine for example, the use of an extended spout faucet can indicate something extraordinary. The pour is concentrated and will come out a bit faster, so your balance does need to be pretty tight. Otherwise opting for a Euro faucet is an aesthetic decision. The majority of Euro faucets we have evaluated are high quality, as expected from an Italian or German shop. Just be sure the faucet you buy will thread on to your domestic shank. Bottom line is that Euro

### NITRO FAUCET



If you want the Guinness pour, and you have set up your system with the required nitrogen/carbon dioxide blend, then you need a nitro faucet. The design of the nitro faucet is entirely different than that of a standard or forward-seal faucet. The most important aspect is to buy stainless steel with quality machining. The economy brand Krome offers a cost-effective stainless steel nitro faucet.

European manufacturers also provide great nitro faucets at a greater cost. It is worth noting that the Guinness faucet is one of the cheapest faucets with a lot of plastic and chrome. But they work, they are practically given away, and they make Diageo a lot of money. So who am I to question their standards? The Guinness handle is riveted to the faucet, and it's not by accident. If you want to dispense a nitro stout that is not Guinness, and need to swap out the handle, good luck with that task. If you have one of these in your basement waiting for the opportunity, know that your homebrew will forever be branded as Guinness.

Overall, expect to spend around \$100 on a decent nitro faucet, preferably one with a steel spout. There is a fine mesh screen in the spout that can get clogged and will also go MIA if not carefully handled when cleaned. This is not a part you can get at Home Depot, so pay attention or buy an extra screen or two. They are cheap, so no worries there. The screen is what produces the cascading nitrogen effect. There is also something called a flow straightener in there, and that part clearly straightens the flow. The high pressure of the nitrogen in the blend gas forces the relatively low volume of CO<sub>2</sub> through the screen and creates the tiny bubbles. Remove the screen and the faucet produces an ordinary flow when 100% CO<sub>2</sub> is correctly applied. Technically, you could use only nitro faucets for all of your beers, with and without the screen and with the proper gas for each beer, depending on the desired effect. However, attempting to dispense anything other than a relatively low carbonation beer through a nitro screen will comically produce something resembling a beer shake. I should mention that Intertap produces a forward seal with an interchangeable threaded spout. One with a screen and one without. They do work and this is an option.

### SELF-CLOSING FAUCETS

Self-closing or spring-loaded faucets have a spring and will automatically close when the handle is released. The spring and associated parts are more items to foul and fail, so they are not recommended. Besides, what is so difficult about closing a faucet that requires help? Because these faucets are gimmicky, they are often featured on low price-point kegerators. If you do have this variety of faucet you should consider upgrading. Do you really need that spring? You don't know what you could be enjoying until you upgrade. Perhaps revealing, few name-brand manufacturers offer spring-loaded faucets. If you find that you or your guests are unable to close the faucet after a fill, look to Italy for quality self-closing faucet designs.

### ROTO FAUCETS



The so-called roto faucet is a type from Europe and they are pretty cool to be honest. The roto part is the rotation of the valve in the faucet body. Pull forward and the valve rotates to the open position. The spout is long and thin, creating a vigorous pour, not unlike a standard Euro design, only more robust. It is a unique piece of equipment, but we just have not found a roto faucet that works really well and can't recommend this type. There is one particularly expensive roto faucet that uses an incredibly bulky body. About an ounce of beer, after the shank but before the roto valve, sits between pours. You can be sure that the beer sitting in ambient temperature is going to go into your glass as foam. If dumping foam is OK with you, as it is with a lot of European establishments, then fine. Otherwise let's drink our precious homebrew, not pour a foamy mess or dump it down the drain.

### SIDE-PULL FAUCETS



Direct from the Czech Republic we have the side-pull, provided for the domestic market by the brand Lukr. This style has started to appear more frequently at American taverns that feature lagers, but it is still fairly rare. As the name suggests, the handle is pulled horizontally. These faucets feature an extended spout that is meant to go to the bottom of the mug or glass. The beer is poured from the bottom up and the spout is immersed in beer. Czech pubs have a few different pouring protocols. The different methods include *Šnyt*, *MlÍko*, *Čochtan*, and *Hladinka*, each with their own unique appeal. We are not going to get into the weeds here. The point of the faucet is to produce different quantities and styles of foam. I'm not one for too much foam, no matter how Old World these things are purported to be. We have installed a few and I'm not impressed with the price, which is somewhere north of bone crushing. The lever is horizontal and does not have a threaded shaft for your marker. Lastly, the handle lives in real estate occupied by the faucet in the adjacent space, so if you have two or more lines there is going to be a fight for living space. The side pull is something we might be seeing more of, either as a fad or a genu-

ine improvement, but for now I am on the fence and hope to hear from users about their experience. U.S. homebrewers are known for leading the way. I think the different Czech pouring methods do offer adventurous home bar enthusiasts an interesting avenue to explore.

## CREAMER FAUCETS


Creamer faucets are a feature of some forward-seal designs. Pushing the handle back slightly opens the faucet and creates a bit of turbulence that intentionally produces foam, not quite cream. The foam is added after the pour is almost completed and will provide a bit or a lot of head in the glass. While nice, slightly cracking an ordinary faucet a few quick jerks at the end of the pour accomplishes the same thing. With a little practice you can generate the perfect foamy head. Or you can drop the nearly full glass a few inches, let the stream of beer hit the beer with velocity and create the desired head. We find this faucet a bit more of a curiosity than a necessity.

## FLOW-CONTROL FAUCETS

Flow-control faucets adjust the gap of the piston shaft in the faucet body. Closing the gap slows the flow rate and opening the shaft allows for full flow. The space in between provides incremental flow rates. If your beer is pouring too fast, you can use a flow-control faucet to slow down the speed of the pour. Because beer falling into the glass at high velocity can cause foaming, you may be tempted to fix your foaming

problem with flow controls. Foamy beer is 90% temperature-related though, so be certain the beer in your glass is the same temperature as the beer in your keg and applied CO<sub>2</sub> pressure is appropriate for your dispense temperature (which is naturally 38 °F/3 °C). If you have a temperature control problem, flow control faucets will not fix that. You will just pour foam slower. If you have a velocity problem, be sure you have sufficient resistance to balance the system. Your choker is probably too short. Correct that first. With that taken care of, flow-control faucets do have some benefits and are useful if you are dispensing highly carbonated beer or filling a growler. The increase in cost is minimal and flow controls provide another thing to tinker with. When in the wide-open position the faucet operates as if there were no flow-control mechanism for a regular pour.

## PROPERLY POURING BEER

Unless you are camping, start with the use of a clean glass. Plastic cups are for Philistines and fraternity brothers. Hold the glass at an approximate 45-degree angle. With the spout near the inside of the glass but not touching the glass, open the faucet all the way. If you have a flow control, adjust appropriately. Fill the glass about three-quarters full. As the beer nears the top lower the glass to create some turbulence and achieve the preferred foam head. Use a clean glass for every beer, or at the very least rinse your glass. If you have a Lukr or Roto faucet and allow the beer to come in contact with the spout, be sure to wipe down the hardware. Enjoy! 



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## MARKETING SPEND

### How to plan and budget for your nano

**F**ar too often a passionate brewer believes the exceptional quality of their product alone exceeds the need for a well thought-out marketing strategy, when nothing could be further from the truth. In a brandscape of more than 8,500 breweries in the United States alone, we must constantly remind ourselves that we are in the business of selling more than in the business of producing. In fact, the ability to influence and cultivate brand loyalty are in large part dependent on how our nanobrewery's products are positioned, priced, and perceived in the marketplace. Developed properly, a marketing plan will be the roadmap to follow to get patrons in your seats and regulars returning. A big piece of that plan is the marketing budget.

A marketing budget documents how much your nanobrewery plans to spend on marketing over a specific period, like a year, quarter, or month. It helps you stay on track financially. We can't measure what we don't track, and in the absence of tracking, we tend to overspend without a plan in place to measure the effectiveness of our investment.

A marketing budget also helps you allocate funds aligned to your nano's purpose. When you know how much you can spend, you can determine which strategies and tactics will work within your means. This includes deciding whether outside help is worth hiring to create content, schedule posts, execute campaigns, and shape your brand's personality.

Having a well-defined budget helps you set benchmarks and goals. It allows you to set realistic expectations for various marketing channels, assign accountability for results, and better understand the revenue you need to bring in to make those marketing efforts worthwhile. It also helps

you plan long-term by preventing you from having to deliberate over an additional spend halfway through the year or abruptly cease a campaign due to unforeseen circumstances. In other words, it greatly reduces your exposure to unexpected expenses while enhancing your ability to plan and execute for long-term success. A marketing budget enables you to create a more consistent and effective strategy because you're constantly focused on the future picture. Most importantly, a marketing budget is an investment in your nanobrewery's growth.

When budgeting for marketing, it helps to categorize planned expenses in three main areas:

**Brand creation**, which includes crafting your brand story and voice, logo design, choosing a color palette, and creating all aspects of package design. This includes label art and any custom glassware you choose to utilize in order to stand out in your patrons' minds.

**Brand support**, which includes your website, sales sheets, point of sale (both for taproom sales and for e-commerce), brochures, hang tags, and even your own business cards.

**Brand proliferation**, which includes both traditional and online advertising, public relations releases, email blasts, newsletters, direct mailings, and all social media.

There are many resources that outline marketing budgets, but the consensus seems to be that startups should consider a range of 12–20% of gross revenue (or projected gross revenue), while established nanos should allocate 6–12%.

In setting up your brewery's marketing budget, you want to make sure you establish and understand your nano's sales funnel, the process your consumer goes through to become a paying customer. A typical sales funnel

**Most importantly, a marketing budget is an investment in your nanobrewery's growth.**



Photo courtesy of Shutterstock.com



**Whether you're going to run your campaigns on your own, hire a freelancer, or tap a digital marketing agency, evaluate how much each will cost and what the expected return should be.**



has four stages: **Awareness** (wow, am I thirsty!), **consideration** (where can I go to quench my thirst?), **decision** (which place is best for me to quench my thirst?), and **action** (I'll go to XYZ Brewing!). Understanding your nano's sales funnel helps you see where you may need a digital marketing strategy to keep people from falling out of that funnel. For example, let's say you notice that your nano's funnel has a ton of people at the consideration stage, but very few make it to the decision stage. While some drop-off is natural, you notice that the decline is more significant than what you'd expect. As a result, you may find that you need to budget more money for strategies that will help get leads from the consideration stage to the decision stage. This could include featured Instagram posts, search engine optimization spend, or pay-per-click (PPC) ads. Knowing your sales cycle will help you anticipate strategies you need to invest in, which will help you budget for your marketing plan wisely.

As you prepare a marketing budget for the first time start by establishing your external costs and gaining a holistic view on your overall sales, general, and administrative (SG&A) spend. This includes operational costs, non-production labor, and general overhead such as utilities, rent, and insurance. Not only will that determine what you can invest in, but it will also help you set a baseline for your return on investment (ROI).

So, for example, let's say it costs your nano \$3 to produce your beer. You sell your beer for \$6. As you contemplate which marketing methods to budget for, you have an idea of how much you want to spend and still profit off that beer.

The next step is determining your nano's sales and business goals. Is that an overall sales increase in dollars or barrels? By how much? By which package type and sales mix by style? Dollars sales per employee or per seat in the taproom? How should we work customer retention into the mix? Do we need to improve gross margin by a few percentage points? Do we want to pay ourselves at least "\$X" in the upcoming year?

You need to know what you want to accomplish in order to set a budget that will allow you to achieve those goals. Be sure the goals are specific, realistic, and timebound. The more precise the goal, the more concrete the reference point when budgeting for marketing because you know *how much* you want to increase sales by and the timeline for achieving that increase versus just knowing that you want to increase overall sales.

You also need to know where you stack up in your current market against the competition. A good place to start

is using social media monitoring tools such as SEMRush to keep track of how people find you online, what you're known for, and what people say about you versus the other brewers in your area. This will help you determine which strategies you'll want to use. A few of the more commonly used digital strategies I see as affordable to nanos include the following:

**Search engine optimization (SEO):** The process of boosting your website's rankings in search results to help drive more relevant, organic traffic to your page.

**PPC advertising:** Paid ads that appear at the top of search results pages and on other web pages. These ads allow you to reach more leads that are ready to convert.

**Social media marketing:** Enables you to connect with your audience one-on-one and deliver informative content to them; allows you to build relationships and nurture them into customers (TikTok and Instagram).

**Social media advertising:** Compelling ad copy and imagery that appears seamlessly in your potential customer's newsfeed, allowing you to build brand recognition (online publications such as Brewbound mastered this).

**Email marketing:** Tailored content that fits your customer's interests (a monthly newsletter).

**Content marketing:** Sharing valuable information with your audience, whether blog posts or videos; establishes you as an authority in the beer industry (videos of tastings, collaborations, regional beer history, etc.).

**Local SEO:** Optimizing for local keywords to help drive more local traffic to your nano or employing geo-targeting.

Whether you're going to run your campaigns on your own, hire a freelancer, or tap a digital marketing agency, evaluate how much each will cost and what the expected return should be. If you decide to keep marketing in-house, the cost will come in the form of salaries and materials you need to execute your campaigns. You may still need to hire outside help or invest in tools that enable you to manage your campaigns. If you hire a freelancer, you'll typically pay by the hour or on a per-project basis. The prices may be higher if the freelancer is more experienced or uses software, which they typically include in their rate. If you go with a digital marketing agency, you'll get everything you need, from tools to people. Unless you're doing a one-off project, you'll pay per month to keep a digital marketing company on retainer.

How much do professional digital marketing services cost for a typical nanobrewer? Here's a range for how much



you could expect to pay, based on what I see in the market with my clients:

- SEO: \$500–\$2,500+ per month**
- PPC: 5–20% of monthly ad spend**
- Content marketing: \$500–\$1,000 per month**
- Social media marketing: \$250–\$2,500 per month**
- Email marketing: \$300–\$500 per month**

Keep in mind, however, that every nano is unique. It is crucial for you to consider your nano's goals when creating your budget. You may opt to create a marketing plan budget that is higher or lower than the industry's average based on these goals.


To create a goals-driven marketing budget, determine your target cost for acquiring a new customer or getting your current customer to return (the latter is typically much less expensive), as well as how many new customers you want to gain through your marketing campaign.

Then, multiply those two numbers and add in any fixed costs. For example, say your target cost-per-acquisition is

\$40 per customer, you want to acquire 200 new customers over the upcoming year, and your fixed costs add up to \$3,000. In that scenario, you'd use the following formula:  
 $(40 \times 200) + 3,000 = 11,000$

So, you'd need to allocate a total of \$11,000 to marketing to achieve your customer acquisition goal.

As you run your marketing campaigns, you can track the number of new customers who walked in your door and your cost per acquisition to determine how well your campaigns are working and what you might want to tweak to improve results. Utilize your point-of-sale to see if the average guest tab or overall foot traffic has increased, as well as the hours of greatest activity. The point-of-sale is one of the nano's most powerful tools as we are predominantly taproom focused.

Finally, be sure to analyze each digital campaign after its completion and measure the effectiveness or ROI of the spend. What worked? What didn't? Why or why not? Utilize those lessons as you move forward with your next set of initiatives and don't be afraid to shift tactics as new lessons are learned. 

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## KEEZER MODIFICATIONS

Giving your draft system polishing touches

I'm a construction/utility worker by trade and I've been mechanically inclined since I was a kid, so taking on a kegerator build sits snugly in my wheelhouse.

**W**hen I started homebrewing, instead of beginning with extract kits and bottles, I jumped all-in opting for all-grain batches and kegging my beer. I like to brew all different styles of beer from hefeweizen to rye IPAs, from wee heavies to imperial stouts . . . and everything in between. Knowing how I started brewing is important because my personality is to jump into the deep-end no matter what I'm doing. Why do something small and simple when you can jack it up?! Realizing I needed cold storage and faucets, one of the first items on my list was a kegerator. I knew I wanted a keezer — a kegerator made from a chest freezer. I'm a construction/utility worker by trade and I've been mechanically inclined since I was a kid, so taking on a keezer build sits snugly in my wheelhouse.

My research on keezer builds started on Homebrew Talk and also Instagram. Who knew there was so much to consider? I have a small basement brewery and I wanted to maximize the available space. I also wanted to keg all the beers but still be able to bottle at times and, of course, it had to look professional. I took in as much information as I could to figure out what would be best for me. What size freezer? How many kegs do I want it to hold? Do I want a collar on my keezer? And so on. So after a lot of time in research mode, it was time to design my blueprint. The first thing that became apparent was that I needed to build a collar . . . but what size? Again maximizing space and functionality was a must. A collar build would give enough clearance with the keg and have the necessary height inside the freezer for my modifications. My blueprint also included storing my CO<sub>2</sub> tank on the compressor hump inside of the keezer so everything is nice

and neat.

The chest freezer is a Fridgidaire 12.7-cu. ft. (0.36-m<sup>3</sup>) that I purchased at a home improvement center. This gives me room for six Corny kegs with room to spare. My blueprint called for the collar to be attached to the base freezer. Some keezers will attach the collar to the lid instead and there are pros and cons to each configuration.

For additional modifications, first I decided to add a circulation system to the keezer to prevent thermal stratification, which will keep the taps colder. I added a handy CO<sub>2</sub> port to the exterior of the keezer. I also added an LED lighting system to the underside of the lid that would illuminate when a magnetic sensor switch was triggered. The final touches were placed on my keezer by custom crafting my own tap handles and creating a digital taplist.

### Tools and Materials

- Chest freezer
- 16 ft. (5 m) 2x8 cedar lumber
- Taprite 7-body, high-pressure, regulator manifold
- (6) Stainless steel 4-in. (10-cm) beer shanks
- (6) Perlick 680ss creamer faucets
- 4-in. (10-cm) jockey box coupler
- Inkbird ITC-1000F
- 120V AC to 12V DC power converter
- EP auto relay
- RioRand PWM DC
- Electrical wires and connectors
- Magnetic door switch
- John Guest flared fittings
- 10 ft. (3 m) of 2-in. (5-cm) PVC pipe
- Atwood 3-in. (7.5-cm) bilge fan
- 3x2-in. (7.5x5-cm) rubber reducer
- LED tape light roll and pin connector
- (6) custom tap handles (optional)
- 32-in. TV with Taplist io app installed (optional)



Photos by Christopher Akocs



## STEP BY STEP

### 1. THE COLLAR BUILD

Once I had my chest freezer in place, I temporarily removed the lid so I could install the collar. Unfortunately I learned the hard way about types of woods. I initially used a less expensive pine wood but it ended up warping. So I had to rebuild my keezer collar and this time went cedar, which is a harder wood and better suited for the high moisture content found in the keezer. The collar itself is 2x8 cedar with mitered edges for a seamless look.

The collar is attached to the base of the freezer using construction adhesive. I placed the freezer lid on top of the collar (not attached yet) and weighted the top to let the adhesive set up for a few days. Once it was set I applied silicone to the inside to seal all the gaps. I waited a few days for the silicone to set before installing the temperature control and faucets.

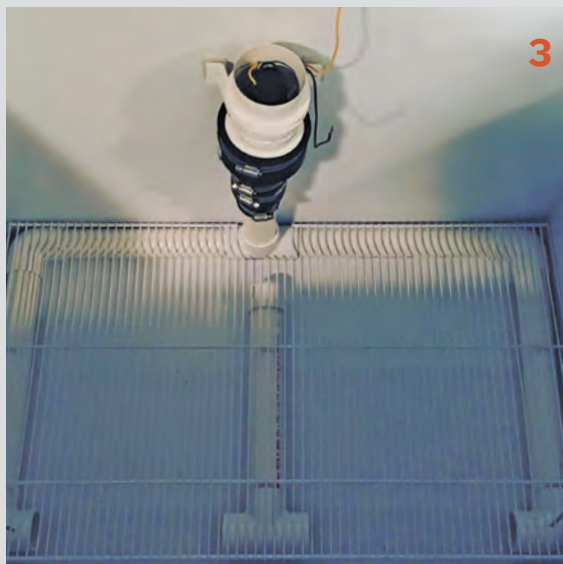
### 2. COLLAR MODIFICATIONS

There are seven  $\frac{1}{4}$ -in. holes drilled into the face of the collar using a hole saw, which allows for six faucets, plus a CO<sub>2</sub> hook-up. There is also a cutout for the temperature control box. I purchased (6) 680ss Perlick faucets with 4-in. (10-cm) shanks and in the seventh hole placed a jockey box coupler shank for a dedicated CO<sub>2</sub> line for my Tapcooler counter-pressure bottle filler or to purge kegs. I installed a 7-body, high-pressure regulator manifold to the collar. This allows each keg to get the right amount of carbonation dialed in for that brew and each tap can be individually adjusted to a desired pressure (as well as my exterior CO<sub>2</sub> outlet). I utilized John Guest flared fittings for all my connections, which allow for easy disassembling for cleaning purposes.

### 3. KEEZER CIRCULATION SYSTEM

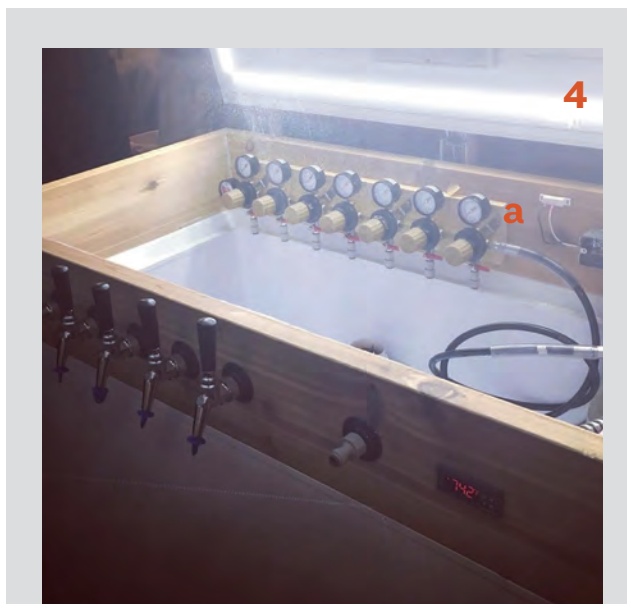
I installed the 2-in. (5-cm) PVC duct system with a 3-in. (7.5-cm) bilge fan for air circulation to keep even temperatures and less fluctuations. This means there is less foaming of the beer when pouring from the taps. The circulation system is wired so that when the keezer lid is open, the circulation system shuts down to prevent blowing out cold air. The fan will then kick back on when the lid is closed.

The duct system on the bottom of the keezer acts as supports for a metal shelf that sits on top of the piping, creating a false bottom. The weight of the kegs is evenly distributed and this allows the duct system to pull the cold air right off the floor of the freezer.



## 4. LED LIGHTING

This is a fairly simple step, but one that was a big upgrade. Some chest freezers come with an interior light, as did mine, but it was not very bright. I don't like working in the dark. The magnetic switch (a) that was used to turn the circulation system on and off when the lid is opened is reversed so the LED lights will turn on when the lid is open and off when closed. The LED lights provide ample brightness to easily see pressure gauges and which Corny keg post is which when I'm trying to hook up a new keg.

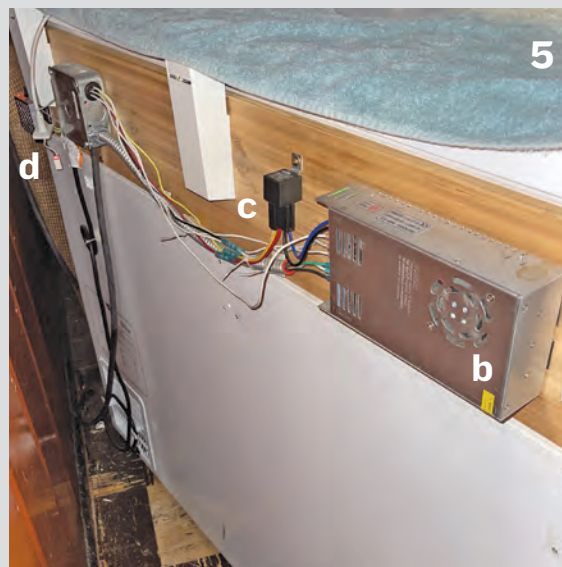


## 5. WIRING IT ALL UP


I installed a 120V to 12V power converter (b) connected to an automotive relay (c) to power and control both the bilge fan and LED lights. I also added a PWM (pulse width modulation) (d) controller to adjust the bilge fan speed.

First I mounted and wired the high-voltage (120V) wire to the power converter. Also I mounted the relay and PWM on the back side of the keezer collar. I installed the magnetic door switch on the inside of the keezer to control the lights and fan. Next, I installed the low-voltage wiring from the power converter to the magnetic door switch in the keezer and to n/o and n/c contacts on the relay. I wired the other side of the magnetic switch to the relay coil and then back to neutral on the power converter. Then I wired the n/c contact wire from the relay to the LED tape lights and then back to neutral on the converter.

Next up, I wired the n/o contact wire out of the relay to the PWM power hot side and then back to neutral. I wired the hot side of the PWM controller to the hot side of the fan, then wired the neutral side of the fan back to the neutral side on the PWM. Wiring schematic can be found at [www.byo.com/project/keezer-modifications](http://www.byo.com/project/keezer-modifications)



## 6. CUSTOM TAP HANDLES AND TAPLIST

To make my keezer look even more professional I had custom tap handles made (no, I did not actually make these myself) and added a digital taplist. My taplist is on display on a 32-in. television mounted back behind the keezer. Overkill? Sure. Awesome? Hell yes! To see more pictures and information about my build, check out my Instagram account [@calculatedriskbrewery](https://www.instagram.com/calculatedriskbrewery) 





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# DRINK TWO AND CALL ME IN THE MORNING

## Balancing medical school and homebrewing


**T**he Dogshead Brewing team first started to take shape when I got my acceptance letter to attend medical school in the fall of 2020. See, I was already a homebrewer having grown up in the craftbrew hotbed of San Diego, California allowing me to develop a taste for beer at a “relatively” young age. My first homebrew was about three years ago and I knew that one of the first things I would be packing when moving to Albert Einstein Medical College in Bronx, New York would be my brewing equipment. The first week of school I recall brewing a lemon drop saison that I could share with fellow classmates. After all, what’s an easier way of making friends than by giving away free beer? Giving away a well-crafted homebrew of course!

It was not long after that I met Kira and Ryan, also first-year medical students, who shared my passion for beer. Kira, a devout “hop head,” is well known for her “study beers” that help her get through hours of studying. Ryan, a lover of all types of beer, is likely adding to his incredible collection of Untappd beer check-ins if he isn’t in class. Eager to delve into the art of homebrewing, the two opted in to join me for my next brew session . . . the first official Dogshead beer, a tasty pale ale that somehow went unnamed. Since then our team has brewed a number of beers, all sporting canine-related names like “The Grapedane” (grapefruit IPA), “The Bad Boy” (West Coast IPA), and “I Peed on the Carpet” (Belgian-style honey ale with a high ABV). The Dogshead name was inspired by my dog, Ash, a terrier-chihuahua mix with very large ears who has quickly become a campus favorite.

Despite the busy schedule of medical school our team has been able to find time to brew. An important part of scheduling a batch is trying to set

aside a period of time when bottling day could potentially take place. This is usually on a weekend after a busy week or an exam. Once a bottling date is set, then we can reverse engineer a convenient brew day and go from there.

Several medical school friends have expressed interest in learning about the process of brewing beer. Many are surprised that brewing beer is even possible in a small New York City apartment. I’m glad to say that I have had several brew days with various classmates curious to see how beer gets made. In fact, having extra pairs of hands around came in handy when zesting grapefruits for Grapedane IPA. Although Dogshead started as a few friends getting together to brew beer, because of the notable interest there have been talks about trying to establish a brewing club through the medical school. Of course, before any new candidate could earn an official Dogshead t-shirt they must go through the initiation process, which would surely include what could be the dullest aspect of brewing — cleaning.

Between figuring out the mechanism of action behind thiazide diuretics and learning the difference between a “lub” and a “dub” heart sound, sipping on a homebrew after a long day of work has become an integral part of the Dogshead medical school experience. I enjoy brewing because, like in medicine, there is always more to learn. Brewing seems to be a dynamic form of art that remains grounded in tradition, much like modern medicine. Besides the potential to become better brewers, the Dogshead team appreciates homebrewing because it gives us a reason to carve out quality time with friends amidst a hectic schedule of classes and study sessions. Brewing continues to remind us of how important it is to come together, relax, and have a homebrew. 

**I enjoy brewing because, like in medicine, there is always more to learn.**



Photo by Jon Crain

*The Dogshead Brewing team, and now second-year medical students, posing for the camera.*



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