

FOR THE **HOMEBREWER & BEER LOVER**

2015-2016

\* Special Edition \*

# zymurgy<sup>®</sup>

The Journal of the American Homebrewers Association<sup>®</sup>

## AN INTRODUCTION TO HOMEBREWING



From the  
American  
Homebrewers  
Association  
[HomebrewersAssociation.org](http://HomebrewersAssociation.org)



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The purpose of the Brewers Association is to promote and protect small and independent American brewers, their craft beers, and the community of brewing enthusiasts. The Brewers Association is a not-for-profit trade Association under Section 501(c)(6) of the Internal Revenue Code.

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# Want to Brew Your Own Beer? Start Here.

**H**ello and welcome to homebrewing! This magazine is a special issue of *Zymurgy* (ziˈmər jeː)—a publication dedicated to the interests of the homebrewer. While this special issue is devoted to new brewers, it also includes some of our regular columns and departments. Through these, we'll tell you a bit more about the hobby, give you some recipes to try and point you toward other resources to help you learn more and meet others who brew.

These pages contain all the information you need to get started brewing your own beer at home. We'll start by walking you through your first batch with all the details for making a great-tasting beer. Everything you need is contained in the section called "Brewing Your First Batch" beginning on page 18. It's easy and you'll have fun both making it and enjoying the finished product.

So, if you are standing in the homebrew store right this minute, with an itch to get started, buy the basic starter kit recommended by your store plus the ingredients given for the first recipe on page 19. Then you can go home, do about 15 minutes of reading and be ready to brew. Go ahead, do your shopping—you can read the rest of the articles when you get home!

Brew on!

*Charlie Papazian*

Founder, American Homebrewers Association

*Gary Glass*

Director, American Homebrewers Association

*Jill Redding*

Editor-in-Chief, *Zymurgy* magazine



## HOW LONG DOES IT TAKE?

Just so you know what to expect, it will be about four weeks before you can drink the beer you make. Here's a basic map of how the process works:

### Brewing

- Get the equipment and buy ingredients (20-30 minutes)
- Clean and sanitize the equipment (10-15 minutes)
- Brew the beer and start the fermentation (60-90 minutes the first time)

### Fermentation

- Here you just wait...(one to three weeks)

### Bottling

- Takes about an hour once fermentation is complete

### Bottle Conditioning

- Here you wait...wait...wait (usually two to four weeks)
- Chill and drink your beer! (feel free to take as much time as you need)

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## Making Your First Batch From Beginning to End

We have included five short articles to teach you the basics of brewing and help you brew your first batch. We recommend that you read the first four articles completely before you start brewing. (Hint: we have found that you can read them in about the time it takes to drink one beer.) Then when you are ready to brew, follow the instructions in each section to make sure you don't forget anything or leave out a critical step.

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# Welcome to Homebrewing

This special edition of *Zymurgy*, the magazine published for members of the American Homebrewers Association (AHA), is intended to be an easy-to-follow guide to launch you into the wonderful world of homebrewing! We are happy to provide this free guide, along with additional free resources in the Let's Brew section of [HomebrewersAssociation.org](http://HomebrewersAssociation.org), to help you on your way to brewing outstanding beers at home.

The AHA is a not-for-profit organization made up of tens of thousands of members from the U.S. and around the world. I invite you to join the AHA and dive right into the fun-filled hobby of homebrewing. Your membership dollars help us to continue our mission of promoting the community of homebrewers and empowering homebrewers to make the best beer in the world. A strong AHA will ensure your right to homebrew is maintained long into the future.

AHA membership benefits include:

- Subscription to *Zymurgy* magazine and eZymurgy.
- Access to the *Zymurgy* app, including access to 16 years of *Zymurgy* magazine.
- AHA Member Deals for discounts at more than 1,200 breweries, pubs, homebrew shops, and more across the U.S.
- [HomebrewersAssociation.org](http://HomebrewersAssociation.org) and AHA Forum.
- Updates on the latest Government Affairs issues affecting your right to brew and access to your favorite craft beers.
- Access to the Great American Beer Festival (GABF) Members-Only Session and GABF member ticket pre-sale.
- Free entry to AHA Rallies.
- Discounts on the latest book offerings from Brewers Publications, and exclusive access to the AHA National Homebrew Competition and AHA National Homebrewers Conference registration.

- Even more. See [HomebrewersAssociation.org](http://HomebrewersAssociation.org) for a full list of AHA member benefits.

Membership in the American Homebrewers Association is a small price to pay for the beer and brewing education, camaraderie, and fun that the AHA brings to homebrewing—

a price that will soon be recouped by your AHA Member Deals benefits. Join online at [HomebrewersAssociation.org](http://HomebrewersAssociation.org) and unlock the wide world of homebrewing.

**Gary Glass is director of the American Homebrewers Association.**



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by Charlie Papazian



# Just Brew It

**T**here is no hobby as rewarding as homebrewing. I started making my own beer 45 years ago. Yikes—that's a long time! I still homebrew 12 to 16 times a year because I love this hobby and the camaraderie it nurtures.

People often ask me why I homebrew, what I like to brew, and why homebrewing is so popular. Hopefully my answers to these questions will help you make your decision to Just Brew It and join more than a million other homebrewers here in the United States.

## Why did I begin homebrewing?

While I was at the University of Virginia, my friend George introduced me to his neighbor who made beer. I had never heard of "homebrew" before, but with little hesitation I found myself trying a neighborly brew. The novelty of making one's own beer intrigued me much more than the taste of what I now recall as a fizzy, cidery Prohibition-style brew. I found myself walking away inspired, and with a cryptic recipe written on a 3x5 card.

## What are my favorite beers to brew at home?

Every brew session is a favorite. The beers I brew are from recipes that reflect the themes of enjoyable drinkability and full-flavored hop and/or malt character. I brew ordinary bitters, IPAs, pale ales, Czech-style dark lagers, Pilsners (both all-malt and adjunct-enhanced), German-style helles beers, and Irish-style stouts.

## What is my favorite "original" recipe (and can you have it)?

If I had a favorite recipe, I'd give it to you. But I have many. Join the American Homebrewers Association for access to my regular column and recipes in each issue of *Zymurgy*, or take a look at *The Complete Joy of Homebrewing* for a collection of my favorites. But remember that even if you use one of my recipes, once you brew it, it's your recipe and your beer. Take pride.

## Why is homebrewing so popular?

It's a fun, rewarding, and accessible hobby. The camaraderie of making, enjoying, and sharing your own beer has always been a driving force. It's both an art and a science, and the hobby is approachable from either a right- or left-brain perspective—creative and innovative, or traditional and scientific—or both.

Brewing your own beer can save you money, but that's not why people brew. We brew because it's fun and we can make exactly the kinds of beers we enjoy.

## What are my top three tips for beginning homebrewers?

1. One of the most important tips for getting involved with homebrewing is

## Keep your beer safe & hygienic



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my mantra: Relax, Don't Worry, Have a Homebrew.

2. Homebrewing is not just about how to brew beer. You'll quickly find that you will establish an intimate relationship with the beer you make. You will want to explore the process, ingredients, and equipment, as well as the science, art, and emotions that make your beer so enjoyable. Be prepared to be an explorer, a pioneer, and a steward of beer and brewing. Have fun. If homebrewing stops being fun, find another hobby.
3. As a homebrewer, you are mostly making beer five gallons at a time. Always keep this in perspective. Buy the best ingredients. Learn. Improve your skill not because you want to squeeze more out of your efforts, but to make the best beer you can.

Enjoy your journey. It will be a rewarding one.

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



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by Professor Surfeit



Each issue of *Zymurgy* carries wisdom and advice on homebrewing from our own world-famous brew guru, Professor Surfeit (a.k.a. Charlie Papazian). Here are some of our favorite letters from this popular column.

### Damn the Instructions— Full Speed Ahead

Dear Professor,  
I have been making beer for about a year now. I just received my first copy of *Zymurgy* and it didn't take me very long to realize that I could improve on the recipe that comes with a can of malt. Still, I have quite a large supply of malt extract on hand, so I wonder if you could suggest a better recipe than the sugar one that comes with the malt. Meanwhile, I'll continue to read *Zymurgy* and learn more about homebrewing.

Thank you,  
Bill Tyson  
Newton, Texas

Dear Bill,  
Well, it won't take you very long to discover that improving on the sugar recipes supplied with many malt extracts is a pretty easy thing to do. It doesn't take a whole lot of reformulation!

For starters, just substitute extract for sugar, pound for pound. That is the simplest thing you can do. If the extract you are using is hop flavored and the straight substitution turns out too bitter for you, then buy the plain, unhopped version of that malt extract and substitute that.

Don't worry too much about over-bitter beer when you first try the recipe, though. Although you are adding more bitterness by substituting hopped extract, you are also adding more body and malt.

Sweetly,  
The Professor, Hb.D.

### Spent Hops Can Kill Your Dog!

Dear Professor,  
I am a fairly new homebrewer (four batches) and have discovered a problem that I believe you can help with. I was brewing a batch of Pilsner the other day and took two bags of hops from the wort and tossed them on the ground to cool while I put the wort into the fermenter. I noticed that my dog had swallowed the bags of hops! I called my vet and he said that it should not be a problem for the dog. I called my local brew supplier and they said the same thing. I looked up a big-time supplier online and called them and they said the dog will be OK. I was relieved.

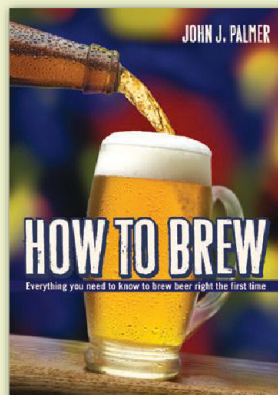
I was online with a cigar bulletin board and posted the question for the brewers on the board. One guy said "Get your dog to the vet NOW!" He posted some articles from a veterinary journal that said hops can kill dogs. It talked about eight case studies in which six of the dogs had died. I called Animal Poison Control and they said "Get your dog to the vet NOW!" So I took him and they made him vomit, gave him charcoal and IV fluids, etc. He survived, thankfully, but the vet said it was only because I saw the dog eat the hops and we got them out before they made him sick. The hops cause "malignant hyperthermia," a sudden and almost irreversible



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increase in body temperature that basically fries their brains and organs. I was amazed that no one seemed to have heard of this.

There is a potential danger for pet owners who might discard their spent hops in the yard or allow their pets to possibly eat the hops. I was surprised to learn that spent hops are more dangerous to dogs than fresh ones. I am contacting suppliers to ask them to include a warning in their brewing instructions. My local vet is spreading the word throughout the industry here as well.

I still find this amazing! Hops seem to be such a safe ingredient. How could a flower be so dangerous? Why would a dog eat something so bitter?

Larry Wilson  
Seminole, Fla.

Dear Larry,  
Thanks for the helpful warning. I did a bit of research and found this on several Web pages including <http://workingdogs.com/doc0175.htm>:

*Hops Homulus (sic) lupulus: the spent hops from the home brewing of beer presents a new danger to dogs. Since 1994, the National Animal Poison Control Center has been consulted on five dogs, only one of whom survived. The dogs present with panting, restlessness, and signs of increasing pain. The most significant symptom is a rapid increase in temperature called malignant hyperthermia. Treatment includes gastric lavage, charcoal slurry, coldwater baths and IV sodium bicarbonate to reverse metabolic acidosis. Hops contain a variety of biologically active compounds; the most suspect, however, is an uncharacterized alkaloid.*

Seriously,  
The Professor, Hb.D.

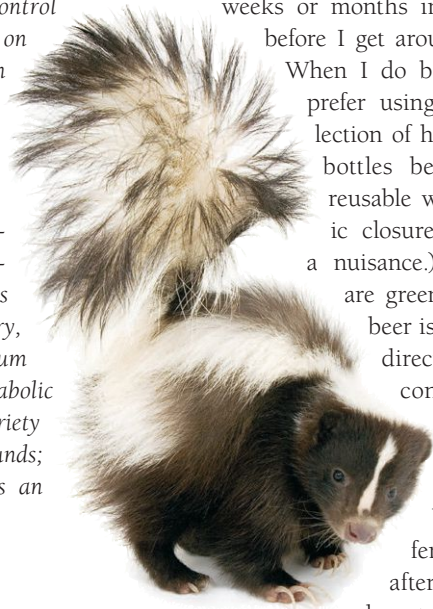
#### **Detrimental Light Damage**

Dear Professor,  
In recent months I have been getting increasingly paranoid about the oft-men-

tioned damaging effects of light on my precious inventory. Like most homebrewers, I use clear glass carboys that sit for weeks or months in my basement before I get around to bottling.

When I do bottle, I tend to prefer using my large collection of half-liter Grolsch bottles because of their reusable wire and ceramic closures. (I find caps a nuisance.) These bottles are green. Although my beer is not exposed to direct sunlight, I am concerned about the fluorescent lighting in my basement, both during fermentation and after bottling. Can long-term exposure to this lighting damage the beer and, if so, what are the telltale signs?

Kent Lancaster  
Ottawa, Canada



Dear Kent,

Yesiree Bob, exposure to sunlight or fluorescent light can do damage to your beer. The result is a not-so-neat skunklike aroma. If you don't get my drift then simply put a green-bottled commercial beer out in the sun for an hour and then compare it to one that hasn't been out of the house. There's no mistake about it. Sunlight is the worst.

But cheeses, don't worry. Don't forget you're a homebrewer. There are some really easy solutions. Wrap your carboy in a towel or put a paper bag over the whole thing. Put your green bottles in a box and close it up. There are any number of things you can do to protect your precious brew.

Made in the shade,  
The Professor, Hb.D.

**The Professor stands ready to answer your beery questions. Stuck on a problem? Can't find an answer? Just write the Professor, Hb.D. and your question will be answered. Send your homebrewing questions to [professor@brewersassociation.org](mailto:professor@brewersassociation.org).**



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# What You'll Need for Your First Batch



In order to make beer at home, you'll need some equipment in addition to the ingredients. A few of these items can be found in your kitchen—things like spoons and pots. But you will need to purchase some additional items as well. Here's a list of what we recommend.

All of these items can be purchased at your local homebrew supply shop. To find a shop near you, search the Homebrew Supply Shop directory at [HomebrewersAssociation.org](http://HomebrewersAssociation.org).

## Things you usually have already

- A stove. Running water. (You can brew without these, but it's not recommended for your first batch!)
- A pot with 2 to 5 gallons (7.6 L to

18.9 L) capacity or more—bigger is better. (Do not use anything with visible rust on the inside.)

- Cooking spoon—plastic, wood, or metal. (Again, no rust!)
- Can opener
- Strainer
- Measuring cup—one cup capacity or larger
- A clean cup or small bowl—used for mixing up the yeast.

## Things You'll Buy From the Homebrew Store: The Basics

Most stores offer a starter kit for homebrewers that contains the basics listed below. Additional nice-to-have items may also be included as detailed in the "Options and Accessories" section that follows.



Watch our brewing equipment video @ [HomebrewersAssociation.org/videos](http://HomebrewersAssociation.org/videos)

## Fermenter

Usually a 6.5- to 7-gallon (24.6 to 26.5 L) food-grade plastic bucket with a tight-fitting lid. The lid will have a small hole where the airlock will be inserted. Veteran brewers often use a glass carboy instead, but the recipes given in the articles that follow assume the use of a plastic bucket fermenter.

## Airlock and stopper

This allows carbon dioxide to escape during fermentation while keeping air out. You will insert this into the hole in the fermenter lid using the proper-sized stopper and then fill the airlock chamber about one-half full with water.

## Thermometer

Used to check the temperature of the beer before adding the yeast.



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### Bottling bucket

An open-topped plastic bucket (that may or may not have a spigot) used during bottling. Beer will be transferred into this

bucket from the fermenter and then from here into the bottles.

### Bottle filler

A section of hard plastic tubing fitted with a spring-loaded plunger at the end. Used to transfer beer into bottles by pressing the plunger end against the bottom of the bottle.

### Bottle capper

A device used to affix bottle caps to the filled bottles of beer.

### Sanitizing agent

Your homebrew shop can recommend various options or you can use unscented household bleach.

### Bottles

You can purchase clean, new bottles from many homebrew stores. Alternately, you can reuse empty bottles (do not use screw-top bottles) and clean them yourself. You'll need two 24-bottle cases of 12-ounce bottles for each 5-gallon batch of beer.

### Bottle cleaning brush

You'll need this eventually to clean your used bottles.

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The advertisement features a wooden background. At the top, text reads "Same superior specialty malts available in extract or whole kernel form." Below this, there are two rows of Briess malt products. The top row consists of four jars of malt extract, labeled "CBW Bavarian Wheat", "CBW Munich", "CBW Sparkling Amber", and "CBW Traditional Dark". The bottom row consists of six jars of malt extract, labeled "White Sorghum Syrup", "CBW Pilsen Light", "CBW Golden Light", "CBW Rye", "CBW Porter", and "CBW Special Dark". Below the jars is a wooden tray filled with various whole kernel malts. In the bottom left corner, there is a Briess logo and text: "BRIESS MALT & INGREDIENTS CO. All Natural Since 1876". At the bottom, there is contact information: "Chilton, WI, USA | 920.844.7711" and "www.BrewingWithBriess.com". A copyright notice "©2013 Briess Industries, Inc." is also present.

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Fermenter



Airlock and Stopper

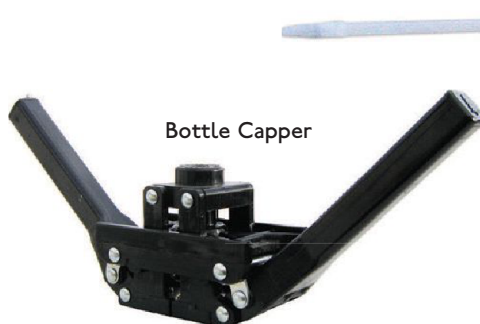




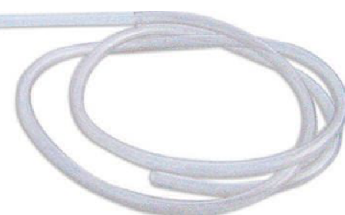
Glass or Plastic Carboy



Hydrometer



Bottle Capper



Bottle Filler

## Options and Accessories

The equipment listed previously will allow you to make beer, but a few additional items will make the process easier or improve the quality of your beer. Some suppliers sell these items as part of a basic setup and in most cases, you will be happy you got them.


### Hydrometer

This is used to measure the specific gravity or density of the beer before and after fermentation. Knowing this allows you to determine the alcohol content and monitor the progress of your beer. Highly recommended.

### Carboy and accessories

Using a 6- to 7-gallon carboy for your initial fermentation requires a bit more care and effort. One caution: do not pour hot wort into an empty glass fermenter as it may break, ruining your beer, your fermenter, and your day. Plastic carboys are rated up to 140° F (60° C). For each carboy, you will want a stopper, a carboy brush for cleaning the vessel, and possibly a handle or web harness. You will also need a large funnel for pouring liquids into the carboy.

### Bottle/Carboy washer

Makes cleaning used bottles and carboys faster and easier. These devices screw onto a faucet (usually with a simple adapter) and clean with a burst of water. 



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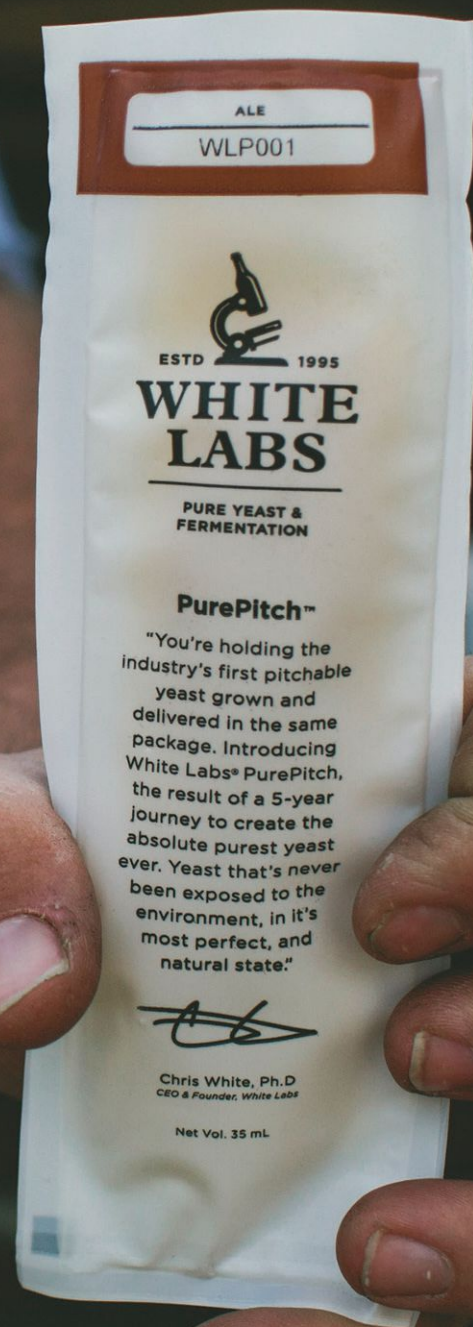
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## An Essential for Good Beer



**B**eer is created when brewers yeast converts malt sugar into alcohol and carbon dioxide. Thus, the whole purpose of brewing is to create the perfect food for microorganisms.

Unfortunately, what is perfect food for brewers yeast is also attractive to other organisms commonly found in foods, such as the bacteria that make vinegar and yogurt. Obviously, you want your beer to taste like beer and not old milk or spoiled wine. Thus, the only way to make good-tasting beer is to make sure that brewers yeast is the only organism that gets a significant chance to eat the food that you prepare for it. That's where sanitation comes in. To make sure the yeast has the upper hand, you need to clean and sanitize everything that will come in contact with

the beer after the boil. (See the sidebar on page 16 for a list of these items.)

Before each item is used, it should first be cleaned of all visible soil or residue and then sanitized. To clean your equipment, use a normal dish cleaning sponge (no scouring pads as these can scratch the surface of your equipment and provide spaces where bacteria can hide), dish soap or other unscented detergent, and plenty of hot water. Rinse equipment thoroughly with hot water after cleaning.



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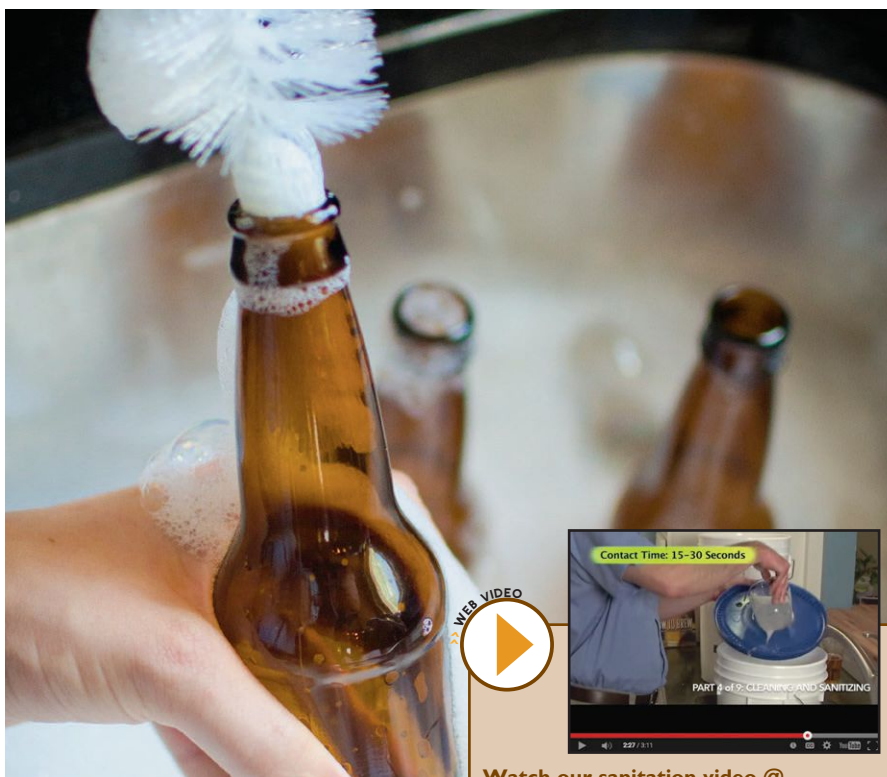


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Watch our sanitation video @  
[HomebrewersAssociation.org/videos](http://HomebrewersAssociation.org/videos)

Once cleaned, all of your equipment must be sanitized. For sanitizing, you can use household bleach or “no-rinse” sanitizers, such as Iodophor or Star San, that are available at your homebrew supply shop. Bleach is the cheapest option. Fill the fermenter or racking bucket with hot tap water and mix in 2 fluid ounces of bleach per 5 gallons of water (59 mL in 19 L). Put all items that need to be sanitized into the bucket to soak. To properly sanitize, soak for at least 10 minutes. When you are ready to use an item, remove it from the bleach solution and rinse it thoroughly with hot tap water (chlorine can cause off-flavors in beer, so be sure all of the bleach solution is rinsed off before using equipment).

“No-rinse” sanitizers only require contact with the surface of items being sanitized, so don’t require soaking. They are effective within seconds of contact and do not require rinsing, which makes these sanitizers easier to use. When properly used, there is no risk of off-flavors from no-rinse sanitizers. You can also fill a spray bottle with a no-rinse sanitizer for an easy-to-use option.

Note that you do not need to sanitize your pot as you will be boiling liquid in it, which will adequately sanitize the pot.

By the way, if you fail to clean and sanitize effectively, the worst that can happen is bad-tasting beer. There are no known human pathogens (i.e. bugs that cause illness) that can survive in beer, so you don’t have to worry about poisoning yourself or your friends. 🍺



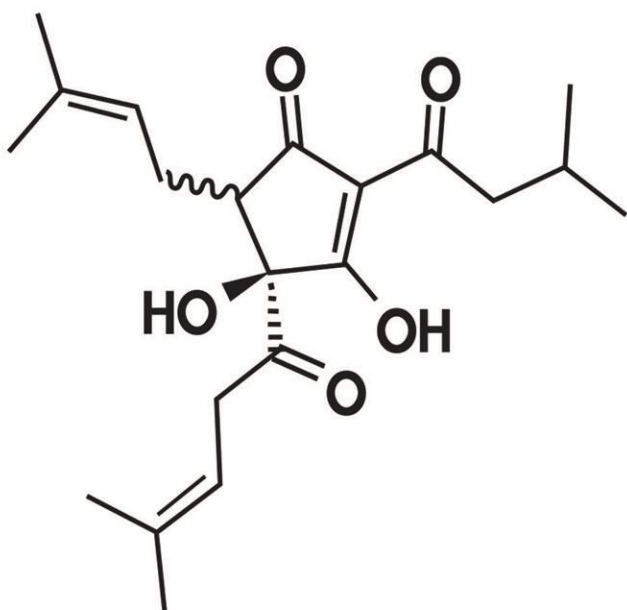
## ITEMS TO CLEAN AND SANITIZE

**On brewing day, this includes the following items:**

- Fermenter
- Fermenter lid
- Airlock parts and stopper
- Strainer
- Thermometer
- Transfer tubing
- Liquid yeast package
- Funnel (if applicable)
- Cup or bowl used for mixing the yeast

**On bottling day, this includes:**

- Racking or bottling bucket
- Racking cane and transfer tubing
- Bottle filler
- Bottles and bottle caps
- Any other object that comes into contact with the beer



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# First @ Batch



# BREW YOUR FIRST BATCH

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**THIS IS A GERMAN-STYLE WHEAT BEER THAT IS EASY TO MAKE AND EASY TO DRINK. IT PROVIDES AN EXCELLENT INTRODUCTION TO THE ART OF BREWING FOR THE FIRST-TIME BREWER.**

**B**efore beginning to brew this German-style wheat beer (weizen) recipe, you'll need to make sure you have all the required equipment and ingredients. You should also have read the previous article on sanitation. Now, before you begin, read the whole procedure so you see how things are going to work and then you'll be ready to dive in and brew.

## Ingredients

### Shopping List

- 2 cans [6.6 lb (3 kg)] Briess Wheat Extract (without yeast packet)
- 1 oz (28 g) Perle or Liberty hop pellets
- 1 vial/pack White Labs WLP300 Hefeweizen ale yeast or Wyeast 3068 Weizen yeast (WLP320 American Hefeweizen yeast or Wyeast 1010 American Wheat yeast can also be used)

These items, along with the basic equipment needed, can be purchased at any homebrew store. If your shop doesn't have these exact ingredients, ask the shop staff for appropriate substitutes.

Once you have all the needed equipment and ingredients, you are ready to make the first batch. It shouldn't take more than 90 minutes from start to finish.

## Procedure

- A. Start by cleaning all necessary equipment. Follow the directions found in the previous article on Homebrew Sanitation (see page 15).
- B. Bring 1 gallon (3.79 L) of water to a boil in a pot large enough to hold 2 gallons (7.6 L) or more.
- C. While the water is heating, submerge the liquid malt extract containers in warm water. This will make the extract easier to pour.
- D. When the water has come to a boil, turn off the burner under the pot—this will keep the extract from scorching when you add it. Stir in the malt extract, taking care to prevent it from collecting on the bottom of the pot. Use a spoon to scrape out the contents, then add a small amount of hot water to the extract container and shake to dissolve any stuck to the sides. Once the extract is completely

dissolved, turn the burner back on and bring to a boil.

- E. When the liquid reaches a rolling boil, add the hops. Hops tend to trigger rapid foaming that can result in the dreaded boil-over. Stir vigorously when adding the hops. Turning the heat off and/or using a spray bottle with cold water can help keep the foam at bay. Boil for 30 minutes total.
- F. During the boil, take time to sanitize all equipment that will come into contact with the liquid after the boil. This will prevent the risk of infection that could spoil the batch. Use the Brew Day Check List under the Let's Brew/Resources section on HomebrewersAssociation.org to keep track. Follow the directions found in the previous article on Homebrew Sanitation (see page 15).
- G. At the end of the boil time, turn off the burner and remove the pot. Let it sit for five minutes.
- H. Fill the clean and sanitized fermenter halfway with cold water. Pour the liquid, now called wort (pronounced wuhrt) from the pot into the sanitized





plastic fermenter. Some homebrewers will pour the wort through a strainer to prevent solid matter, such as hops, from making it into the fermenter. Add enough cold water to reach 5 gallons in volume. Note: if using a glass fermenter, do not add wort over 100° F (37.8° C), as it could cause the fer-

menter to shatter. (See the sidebar on page 21.)

- I. Using a thermometer, monitor the temperature of the wort. When it has dropped below 75° F (24° C), it is ready for yeast. If you have a hydrometer, take a reading before pitching. To do this, siphon enough
- J. Sanitize the liquid yeast package and pour the yeast directly into the wort. The next article on “Managing Fermentation” covers the role of yeast in more detail.
- K. Seal the fermenter with the lid and an airlock. Add water or no-rinse sanitizer solution or high-proof alcohol to the airlock. This allows CO<sub>2</sub>, a byproduct of fermentation, to escape the fermenter while preventing wild yeast and bacteria from entering.
- L. Shake the fermenter rapidly for a minute or two to oxygenate the yeast. Yeast need oxygen to perform fermentation optimally. After the initial shake, take care to prevent the wort from splashing until the beer is bottled and enjoyed.
- M. Store the fermenter in an area where the temperature will stay around 65-75° F (18-24° C). Select a location that holds a fairly steady temperature, allows for minimal disturbance (splashing), and prevents light from reaching the wort.



## MAKING AUTHENTIC IRISH STOUT

The ebony blackness of stout somehow seems to attract attention among beer drinkers and many have grown to love the flavor that goes with it. This beer moves beyond malt extract to include the use of grains in the brewing process. The procedure is still very simple and you'll love the results.

### Equipment

In addition to the basic equipment used for the first batch, you will need a grain bag, approximately 7 inches by 7 inches (17.8 cm by 17.8 cm) or larger, OR a large kitchen strainer for this recipe.

### Ingredients

- 1 lb (0.45 kg) pre-crushed roasted barley\*
- 1 can [3.3 lb (1.5 kg)] Muntons Hopped Amber Malt Extract
- 2 lbs (0.9 kg) light dry malt extract (Muntons or other)
- 1 packet dry ale yeast

\* Brewing grains must be crushed before use. Your local homebrew supply store will have a mill for crushing grain.

- Target Original Gravity: 1.043

### Procedure

Put 1 gallon (3.8 L) of hot water in the pot.

Put the crushed roasted barley in the grain bag and close securely. Put the grain bag in the water and begin heating the water on the stove. Stir every three to five minutes until the water comes to a boil. (If you don't have a grain bag, you can add the grains directly to the water.)

Remove the grain bag as the water begins to boil. Let the bag drain into the pot. (If you are not using a grain bag, use a strainer to fish out as much grain debris as possible once you reach a boil.)

Once the grain is removed, allow the liquid to boil for about 15 minutes.


Turn off the burner and add Muntons Hopped Amber Malt Extract and dry malt extract. Stir until dissolved.

Turn on heat and boil for five more minutes, stirring vigorously to avoid a boil-over.

Fill the fermenter one-half full with cold water.

Turn off the burner and add the hot wort to the cold water in the fermenter. Top up fermenter to 5 gallons (18.9 L) with cold water if necessary. Allow to cool to 75° F (24° C) or lower, then follow the instructions in “Managing Fermentation” (page 23) to prepare the yeast and conduct the fermentation.

For additional recipes see “Winners Circle” on page 37.

Your beer will stay in the fermenter for about a week, but you'll want to keep an eye on it so you know what is going on. For now, take a break and enjoy a beer to toast your hard work in your own homebrewery. When you get a chance, read the next article on managing fermentation to help you monitor and assess the progress of your first batch. 

---

## AMERICAN-STYLE PALE ALE

This hoppy American-style pale ale is similar to popular craft-brewed American pale ales. It is light in color, with a citrusy, floral hop flavor and aroma.

### INGREDIENTS

<b>1 can</b>	[3.75 lb (1.7 kg)] Coopers English Bitter Brewing Kit (includes a packet of yeast)
<b>2.0 lb</b>	(0.9 kg) Muntons light dry malt extract
<b>1.0 oz</b>	(28 g) Cascade hop pellets

**Expected Original Gravity:** 1.045

### DIRECTIONS

Put 1 gallon (3.79 L) of water in the pot and bring to a boil.

Turn off burner and add the malt extract. Stir until dissolved, then turn on the burner and bring to a boil. You will boil for a total of 30 minutes. When there are five minutes left in the boil, add the hop pellets. Stir as needed to avoid boil-over.

Fill the fermenter one-half full with cold water. After shutting off the burner, allow the hot wort to stand for at least five minutes before adding to the fermenter. (If using a glass fermenter, follow instructions in the sidebar at right to avoid breakage.)

Add the hot wort to the cold water in the fermenter, topping up to 5 gallons (18.9 L) if necessary. Let cool to 75° F (24° C) or lower, then sprinkle the yeast on top of the wort. Do not stir the yeast; allow it to dissolve on its own. Follow the instructions in "Managing Fermentation" (page 23) to monitor the fermentation.

---



### NOTES ON THE USE OF GLASS CARBOYS



The procedure for the first beer has been written assuming the use of a plastic bucket fermenter with a removable top. Use of a glass fermenter will change some of the steps. First, it is not safe to pour hot wort into a glass fermenter, even when it is partially filled with cold water. Thermal expansion could cause the fermenter to break. Second, you will not be able to dip a sanitized thermometer in the fermenter to monitor temperature.

To adjust, you will want to cool the wort in the pot you use for boiling. When the boil is finished, turn off the burner and remove the pot. Rather than adding cold water to the fermenter, you can add cold water to the pot to help cool the wort. Add as much as the pot will hold while still being manageable. Then float your sanitized thermometer in the pot, cover it and set it in a cool place. This cool place might include a sink partially filled with ice water, a refrigerator or freezer, or even a snowy porch step or chilly basement corner. When the temperature has dropped to 100° F (38° C), it is safe to pour the wort into the fermenter and fill it up with cold water.

To take a hydrometer reading, you will have to remove some wort from the fermenter after the water has been added. Handling full glass carboys is a bit hazardous, so if you don't feel you can do it safely, it may be best to skip this step. But if you can manage it, shake or swirl the fermenter a bit to make sure things are well mixed inside and then carefully tip it enough to pour out about a cup of the wort. You may also use a sanitized siphon hose or "wine thief" to take a sample from your carboy. This wort can be put in the hydrometer tube for a reading of your original gravity or OG. (Do not return any of this wort to the fermenter or you'll risk contamination of the whole batch.)

Once this is done, you are ready to attach the stopper and the fermentation lock and place the fermenter in a suitable location for fermentation. The only other factor you'll want to consider is that glass carboys sometimes overflow during fermentation. Normally, you'll have little headspace below the neck of the fermenter, so you'll want to place the fermenter in a box lined with a garbage bag or something similar so that it will be easy to clean up any spills that may occur. (Later you'll learn how to manage this with a blow-off tube.)

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### ABOUT THE AUTHOR

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



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# Managing Fermentation, or the Art of Yeast Wrangling

**W**hile brewers like to claim that they make beer, it is actually the yeast that turn our prepared sugar solution into an alcoholic beverage. During this process we brewers mostly wait—although some amount of watching is useful as well. This article discusses fermentation and your role as the brewer. It begins by describing a more desirable technique for preparing and adding dry yeast and then

**LIQUID YEAST  
PACKAGES HAVE A  
MORE LIMITED SHELF  
LIFE THAN DRY YEAST.**

continues with a discussion on fermentation itself. After the fermentation is over, you'll be ready for bottling.

## Pitching Dry Yeast

Each time you make beer, you'll be adding (pitching) yeast once the temperature of the wort drops below 75° F (24° C). While you can sprinkle dry yeast on top of cool wort, you'll improve the probability for success if you take a few minutes to prepare the yeast for the feast it is about to receive.

To do this, you'll run warm (about 98-100° F or 37-38° C) water into a clean and sani-

tized cup, bowl or measuring cup. Open the yeast packet and pour it onto the warm water without stirring. Allow the yeast to dissolve in the warm water for about 10 minutes then stir in with a sanitized spoon.

Once prepared, this yeast slurry can be added to the cool wort in the fermenter. Then you will attach the lid and fermentation lock. (Don't forget to put some water in the airlock to serve as an airflow barrier.) Fermentation should start within 24 hours. During fermentation, you'll want to store the fermenter someplace where the temperature will stay around 65 to 75° F (18-24° C). If you

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have any control over it, the cooler end of this range is better.

By the way, if you buy a package of dry yeast and don't use it, toss it in the refrigerator until you do need it. This will help to sustain the freshness and vitality of the yeast.

### Liquid Yeasts

Many homebrewers use liquid yeast preparations as an alternative to the packages of dry yeast. There is a wider variety of liquid yeast than there is of dry yeast. Each strain of yeast produces different characteristics in the finished beer and often you must use a special yeast strain when you want to create a particular style of beer.

Liquid yeasts come in packages that contain enough yeast for a 5 gallon (18.9 L) batch. One style comes in a foil pouch. To use it, slap the pouch to break a small wort package inside and incubate the package for three hours. The expanded pack is ready to be pitched into the beer. Another brand of liquid yeast comes in a plastic packet or vial. The contents of the packet or vial can be pitched directly into the wort.

Liquid yeasts have a more limited shelf life than dry yeasts. Liquid yeasts carry a date indicating when they were filled by the manufacturer or a best-before date.

### Fermentation

If it is convenient, you'll want to check the fermenting brew every 12 to 24 hours for activity. If all goes well, you should see vigorous activity within the first day. This will be indicated by rapid bubbling of carbon dioxide out of the airlock and also by the development of foam, called krausen, at the top of the liquid level. This is usually visible from the outside even with opaque white plastic fermenters.


Once this has happened, you know that everything will be OK. In a week or so, your beer will be ready to bottle.

If you don't see any signs of fermentation activity within the first 48 hours, there may be trouble. Generally, the best approach is to wait it out. If you've been away for a couple of days or forgot to check for activity during the first 48 hours, it may have done its thing while you were away. In

this case you should still see a ring of gunk around the top edge.

If you get a quick initial fermentation (within 48 hours), you'll most likely be ready to bottle five to seven days after the brew day. Follow the instructions for bottling on page 27. If your fermentation starts more slowly, you must wait until all activity has ceased before you think about bottling. Check the fermentation lock every day or so and when you can see no more visible bubbling, wait another three to five days before proceeding to bottling.

If you fail to notice any signs of fermentation after a week, you may open the fermenter and check on things. Before you do this, clean and sanitize both the inside and outside of a measuring cup. Use this to collect about a one-cup sample of the beer or wort once you have removed the airlock and lid. Once the sample is collected, replace the lid and airlock. Now you have a sample of your beer and you can assess its condition. First, if you have a hydrometer, fill the hydrometer tube and take a reading. If it's not below 1.020, you might need to wait longer and take multiple hydrometer readings.



**Gerry Lynch**  
**1st-Category 18**  
**NHC 2015**

I went through 4 recipe variations, entered several local competitions and took in everyone's advice before I entered the final version of my NHC Gold medal winning Tripel to the National Homebrew Competition. The one thing that didn't change is my use of PBW and Star San throughout the entire process. My guarantee to a clean brewing process every time.

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### HomebrewersAssociation.org

The official website of the American Homebrewers Association is packed with information on homebrewing, including the online AHA Forum for homebrewers.

### How to Brew by John Palmer

A complete guide to ingredients, methods, equipment and recipes for brewing beer at home.

### The Complete Joy of Homebrewing by Charlie Papazian

An excellent guide to both beginning and advanced brewing techniques and the standard text for every homebrewer.

### Join a Homebrew Club

Clubs welcome new members—especially if they are carrying a few bottles of homebrew! Check HomebrewersAssociation.org for a list of clubs near you.

### Your Local Homebrew Shop

A valuable resource for both supplies and advice—check out our Homebrew Supply Shops directory at HomebrewersAssociation.org.

Whether you have a hydrometer or not, you can also taste the beer. If it is thick and tastes very sweet and syrupy, then it most likely has not fermented. If it has the general properties of beer (minus the carbonation at this point), then you are on the right track. In either case, don't return the sample to your fermenter—it can contaminate the batch. If you are in doubt, save the sample in the refrigerator and ask the folks at your local homebrew shop at your earliest convenience—they'll be glad to help out.



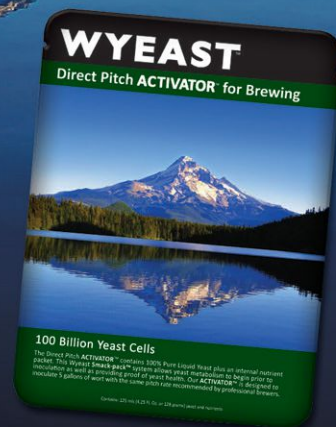
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bottling @



# BOTTLING YOUR BEER

**A FEW DAYS AFTER FERMENTATION IS COMPLETE, YOU ARE READY TO BOTTLE YOUR BEER. HERE'S A CHECKLIST OF THE THINGS YOU'LL NEED ON BOTTLING DAY.**

## **Equipment**

- Measuring cup, one cup (237 mL) or larger capacity, capable of measuring 0.75 cup (177 mL)
- Small pot for boiling water
- Bottling bucket [7 gallon (26.5 L), plastic]
- Racking cane and transfer tubing
- Bottle filler
- Hydrometer (optional)
- Bottle capper

## **Supplies**

- 50+ 12-ounce bottles
- 50+ bottle caps
- Corn sugar (purchased from your local homebrew supply shop)

## **Overview**

First, if you haven't used a bottle capper before, experiment with it a bit on an empty bottle or two. Once you've got the hang of it, just use a bottle opener to remove the practice caps from the empty bottles. (Just think, you'll soon be doing that to bottles of beer that you brewed yourself!)

Now, here's the overview of the bottling process. First, you'll sanitize everything to make sure that you will wind up with good-tasting beer! Next, you'll transfer the beer from the fermenter to the bottling bucket and add a bit of sugar to the beer

so that it will carbonate in the bottles. After that, you are ready to fill the bottles and cap them.

Throughout this process, it's important to minimize splashing, foaming, and aeration of the beer as this can have undesirable flavor effects. This isn't a huge deal, but just remember that "quiet is cool" when dealing with fermented beer.

## **Sanitize the Equipment and Bottles**

The first step in bottling is cleaning. All of the equipment that will touch the beer—no matter how briefly—must be cleaned and sanitized as described in our article on sanitation. See page 16 for a list of things you need to sanitize on bottling day. In addition, all the bottles must be cleaned and sanitized as well. If you are using new bottles, you can usually go straight to the sanitizing step.

## **Racking and Priming the Beer**

Prior to putting the beer into bottles, it should be removed from the spent yeast and other debris, collectively called "trub" (pronounced troob), at the bottom of the fermenter. Trub can create haze and off flavors in the finished beer, so you do not want it going into the beer you put in bottles.

In the process of removing the beer from the trub, you will also add some "priming" sugar for the remaining yeast (there is still plenty of yeast suspended in the fermented beer at this point) to consume and produce carbon dioxide in the sealed bottles, naturally carbonating your beer. The standard quantity of sugar used for priming five gallons of beer is 0.75 cup (177 g). Use corn sugar (also known as dextrose), available at your local homebrew supply shop, for this purpose. You should not use ordinary table sugar.

Measure the sugar using a measuring cup and then stir it into two cups (473 mL) of boiling water. Remove the sugar water from the burner and let it sit for at least 10 minutes to ensure the solution is properly sanitized. Pour the sugar solution into the sanitized bottling bucket.

"Racking" is a brewer's term for transferring or moving the beer from one vessel to another. In this case, we'll rack the beer off the trub in the fermenter into the bottling bucket with the priming sugar solution using the sanitized racking tube and cane. (See the sidebar on page 28 for how to start the transfer without sucking on the tube!)

To rack, we'll use the magic of siphon action to move the beer. Siphon power



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### SIPHON YOUR BEER—PLEASE DON'T SUCK!

Once your beer has fermented, you'll need to transfer it from the fermenter to the bottling bucket. This will probably be the first time that you have occasion to use the racking cane and tube. It needs to be filled with sanitizer before use and then you'll need to get it full of beer so that it will flow by siphon action for racking.

When trying to get the racking cane and tubing started, your natural inclination is to stick the cane into the sanitizer or beer and then suck on the tube end to draw the beer into the tube. Bad idea. The human mouth is full of nasty bacteria—even after treatment with an anti-bacterial mouthwash. To get around this, you can fill the cane and tube once at the beginning of your day and then keep them filled with some fluid until you are done. Here's one approach.

At the beginning of the day, fill the whole racking tube and cane assembly with water. You can suck on it here if you want, but better yet, hold the open end of the tubing up against the faucet and let the pressure of the water fill the device. Then drop the cane end into your bottling bucket filled with sanitizer. Using siphon action, open the clamp on the end of the tubing and use a measuring cup or other small container to run solution through the racking cane and tubing until they are full of sanitizer. Close the clamp and throw the clamp end into the bucket of sanitizing solution along with the cane end so that both can soak.

When the soaking is done, you will have a sanitized racking cane and tube that are full of sanitizing solution. For the rest of the day, you'll want to keep that tube and cane full of liquid—that way you'll always be ready to start the flow of liquid and you'll never have to suck on the end. Voilà!

Photos © Brewers Association

depends on keeping the level of the hose end and the liquid in the bottom container lower than the level of liquid in the top container. Keep this in mind and adjust things during the racking process if you need to. An auto-siphon can also be used (for more on this, see the Beyond Basics section on page 31.).

Put the fermenter on the counter with the bottling bucket below it on a chair set directly in front of the counter. (Alternately, you can put the fermenter on a chair and the bottling bucket below it on the floor.)

Now put the racking cane filled with sanitizer in the fermenter, hanging the tube end with the clamp closed below near the outside of the bottling bucket. Ideally, the height of the bottling bucket should be such that the tube will rest on or near the bottom of the bucket when the hose is put into the bucket. Use a large clean, sanitized cup or bowl below the fermenter to drain the sanitizer from the racking cane and tubing to start the siphon of your beer. Release the clamp and let the sanitizer flow into the cup or bowl until you get

beer coming through the end of the tube. Clamp the tube, then move the end of the tube to the bottom of the bottling bucket and release the clamp again to allow the beer to flow into the bucket. Discard the sanitizer. Try to minimize splashing by keeping the end of the tube submerged in beer. The beer flowing into the bottling bucket will mix evenly with the priming sugar solution you previously added to the bucket.

Near the end of racking, you will want to tip the fermenter to keep the end of the racking tube submerged in beer for as long as possible and minimize beer loss. Then, as the thimble on the racking cane is about to emerge from the last of the beer, close the clamp on the tube end so that the racking tube and cane remain filled with beer.

### Bottling

Set the bottling bucket on the counter or a chair and make a work area for yourself on the floor so that siphon power will move the beer for you. Do not bottle on carpet as you will probably spill some beer in the process!

Next, arrange the bottles nearby. You may

find it convenient to leave them in the case boxes to make them easier to handle.

With the racking tube clamp still closed, affix the bottle filler to the end of the tube. Now use the empty priming sugar cup to practice. With the racking cane in the beer and the bottle filler in your priming cup, open the clamp on the racking tube. Then press down on the bottle filler so that beer flows into the cup. Alternatively, attach a bottle filler to the bottling bucket spigot, if your bottling bucket is so equipped.

If you want, put six ounces or so (177 mL) of beer into the cup and use this to measure the gravity with your hydrometer. The gravity recorded at this point is known as “final” or “terminal” gravity and usually abbreviated as “FG” or “TG.” (Oh, and you can drink the beer you collect for the hydrometer reading—don’t add it back to the stuff you are going to bottle.)

You are now ready to fill those sanitized bottles! Insert the bottle filler into a bottle and press it against the bottom of the bottle to start the flow of beer. Continue until the liquid level comes near the top of

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the bottle. As soon as you release the pressure on the filler, the flow of beer will stop. Then, as you remove the filler from the bottle, the level of beer will drop. When the filler is removed, the beer will be about an inch from the top of the bottle. Be sure to leave an inch or so of head space in the bottle to ensure proper carbonation.

At this stage, you may find it easiest to fill a whole case of bottles before you begin capping.

As you fill, keep an eye on the level of beer in the bottling bucket. When it starts to get low, tilt the bucket so that you can draw out most of the beer without sucking up any air.

Once the bottles are filled and capped, they need to rest for two weeks to a month before they'll be ready to drink. Ideally, you will keep them at room temperature, 65 to 75° F (18 to 24° C), during this time so that the fermentation and aging processes can take place properly.

It is hard to wait, but patience is usually rewarded with better tasting beer. (Of

course to prove this, you might have to taste one bottle after two weeks.) If you are that anxious, go ahead and make another batch of beer so that you'll have a steady supply coming once you taste the first batch.

By the way, this is the stage where you start thinking about that old bugaboo of homebrewing—the exploding bottle. The sanitation and priming techniques we use today make this an extremely rare occurrence. Nonetheless, it is a good idea to keep your bottled beer stored inside cardboard case boxes with the lids closed. That way, if one does happen to overcarbonate and explode, the glass will be contained inside the box.

After the beers have aged, put a couple of bottles in the refrigerator to chill them down. Open and enjoy.

### Labeling your Brew

If you drink all of one batch before you make another, you'll never have any need to label your beers. But often batches overlap, so some system of labeling comes in handy.

The easiest is to take a felt tip marker and mark a batch number on the top of each

bottle cap. If you want more than that, you can get some of the small, round, self-adhesive labels sold at office supply stores and affix them to the tops of the bottles. With these, you can write out some additional information including the name, style, bottling date, etc. if you want to.

Another fun thing to do with your homebrew is to have some labels made up to go on the front of the bottle. If you are artistic or have some skill with a computer, this can be easy to do. Homebrew shops often offer gummed paper that is pre-cut or perforated to produce normal bottle-sized labels. But whatever you do, remember the three most important rules of bottle labels: 1) Have fun, 2) Go wild, and 3) Show off.



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## Even More Brew Toys

Just about any kit or extract beer can be made using the basic equipment you buy to make your first beer. But as you advance, the following items may prove useful.

### Carbon Water Filter

Carbon filtration removes chlorine from your tap water. This is important because chlorine can form unpleasant-tasting compounds in your beer. A simple faucet-attached unit can be installed in 10 minutes without requiring any changes in your plumbing.

### Large Brew Pot

Under ideal circumstances, the entire volume of wort that will go into the fermenter

should be boiled. To do this, you will need a brew pot that will hold at least 7 gallons (26.5 L) of liquid.

### Wort Chiller

This is a long section of copper or stainless steel tube that has been coiled up to fit inside your brew pot. Water is run through the coil while it sits in your hot wort in order to quickly chill the wort after boiling. If the volume of wort you boil is more than 2 gallons (9.1 L), we strongly suggest you acquire this piece of equipment.

### Secondary Fermenter

As homebrewers advance, one of the first



Wort Chiller

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Grain Mill

things they add to their equipment is a secondary fermenter. This is just an additional fermenter, which allows you to rack your beer off the trub in the primary fermenter so that it can be aged. If left on the trub too long, the beer will eventually develop off-flavors. Many beer styles benefit from extended aging, and a secondary fermenter allows you to age your beer without risk of developing off-flavors from aging in the primary fermenter. You can use your bottling bucket as a secondary fermenter; just rack back to your cleaned and sanitized primary fermenter when you need to bottle.

### Auto Siphon

An auto siphon takes the work out of racking (transferring) wort and beer. Simply place the auto siphon in your fermenter, give it a few pumps, and watch the liquid flow!

### Propane Burner

Few domestic stoves are powerful enough to boil 6 or 7 gallons (22.7–26.5 L) of wort in a reasonable time period. As an alternative, you might buy a propane-fueled outdoor burner (a.k.a. turkey fryer). These connect to readily available propane tanks and put out enough heat to quickly pro-

duce a rolling boil. Just remember, these burners must be used outdoors!


### Grain Mill

Many homebrew shops will crush grain for you. If you want to have greater control over the crush that you get, you can mill your own. A number of grain mills designed specifically for homebrewing can be purchased at homebrew stores.

### Refractometer

A refractometer measures gravity like a hydrometer, but with a fraction of the sample. Just a few drops of wort are placed on the refractometer to get an original gravity reading.

### Good Reading

If you haven't already, check out your local homebrew store or the shop link on [HomebrewersAssociation.org](http://HomebrewersAssociation.org) to find out about books for homebrewers. Other good resources include *Zymurgy* magazine, eZymurgy (an electronic version of *Zymurgy*) and the *Zymurgy* mobile apps; and the many resources available at [HomebrewersAssociation.org](http://HomebrewersAssociation.org), including recipes. 





Propane Burner

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# Brewing Great Extract Beers

Using malt extract has both advantages and disadvantages over using a grain mash, but ultimately you are sacrificing control over the brewing process—and a little extra cash—for the convenience extract offers. With today's sophisticated methods for producing extracts, there are no sacrifices in quality. Here are the highlights.

## Malt Extract Pros

- Requires less brewing equipment
- Less time needed per brew
- Easier to brew high-strength beers
- Bulk brands often cheaper and fresher
- Convenient medium for making yeast starters

- Comes in a variety of grades (e.g. amber, light, dark, etc.)
- Widely available
- Unhopped extract quite versatile for recipe formulation
- Hopped extract can make brewing process extremely easy
- Can be used to supplement all-grain beers or kit beers
- Great yeast nutrient for meads

## Malt Extract Cons

- Expensive relative to all-grain
- Limited shelf life—will darken over time
- Both syrup and powdered forms can be messy

- Water composition, dissolved salts and barley quality out of brewer's control
- No control over fermentability of diluted wort
- Even extra-light extracts can produce darker beers than all-grain process
- Can scorch if added directly to a boiling kettle

## Suggestions for Maximizing your Malt Extract Experience

- Use the freshest extract you can find
- Dilute with softest water possible
- Use light or extra light extract and color with specialty grains if desired
- Use plain, unhopped extract and add hops separately

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## Jaromir Jagr Honey Lager

### INGREDIENTS

for 5 U.S. gallons (19 liters)

<b>5.0 lb</b>	(2.26 kg) light liquid malt extract
<b>1.0 lb</b>	(0.45 kg) honey
<b>0.5 lb</b>	(227 g) 10° L crystal malt
<b>1.0 oz</b>	(28 g) US Hallertau hops (pellets), 4% alpha acid (60 min)
<b>0.5 oz</b>	(14 g) US Hallertau hops (pellets), 4% alpha acid (30 min)
<b>2 packages</b>	Wyeast 2007 Pilsen Lager or White Labs WLP800 Pilsner lager yeast

**Original Specific Gravity:** 1.042

**Boil Time:** 60 minutes

### DIRECTIONS

This is a light, dry, easy-drinking easy-to-brew Pilsner beer with a touch of honey. It goes well with hockey games.

Pilsner lager strains are attenuative enough to make this a balanced, refreshing lager, but remember that a hefty pitching rate and a lengthy lagering time are necessities for this beer. Steep crushed crystal malt in 155° F (68° C) soft brewing water for 30 minutes, then remove grains, add honey and extract, and bring to a boil. The larger the volume of wort you can manage to boil, the lighter a beer you'll end up with. Skim off any foam that collects on the surface of the wort, then carefully add your first charge of hops. Boil for 30 minutes, add the last hop charge, and boil another 30 minutes. Chill down to at least 60° F (16° C), aerate (stir or shake to dissolve oxygen in wort, which will help fermentation), and pitch yeast. Ferment at 50 to 53° F (10 to 12° C) until fermentation is complete, then rack into secondary fermenter and lager (cold age) for 10-12 weeks at 35° F (2° C) or so. Prime with Coopers Carbonation Drops at bottling.

- Store away from heat, light and oxygen
- Remove kettle from heat before adding
- Dry extract added to boiling wort = potential boilover
- Liquid malt extract (syrup) contains about 20-percent water
- Heat extract syrup just before adding to lower viscosity
- For kit brewing, substitute dry malt extract whenever sugar is called for

### Estimating Original Gravity

If you are making a purely extract-based beer, you can use the following method to estimate your original gravity (O.G.). Brewing software packages will help you determine your O.G. with a greater degree of accuracy, since you can include a greater variety of parameters, but for the beginning brewer, this method will get you in the ballpark. As a benchmark, 1 pound (0.45 kg) of the following fermentable sugars dissolved in 1 gallon of water will yield the following original gravities:

*Granulated sugar* 1.042

*Corn sugar (dextrose)* 1.040

*Dry malt extract* 1.040


*Liquid malt extract* 1.034

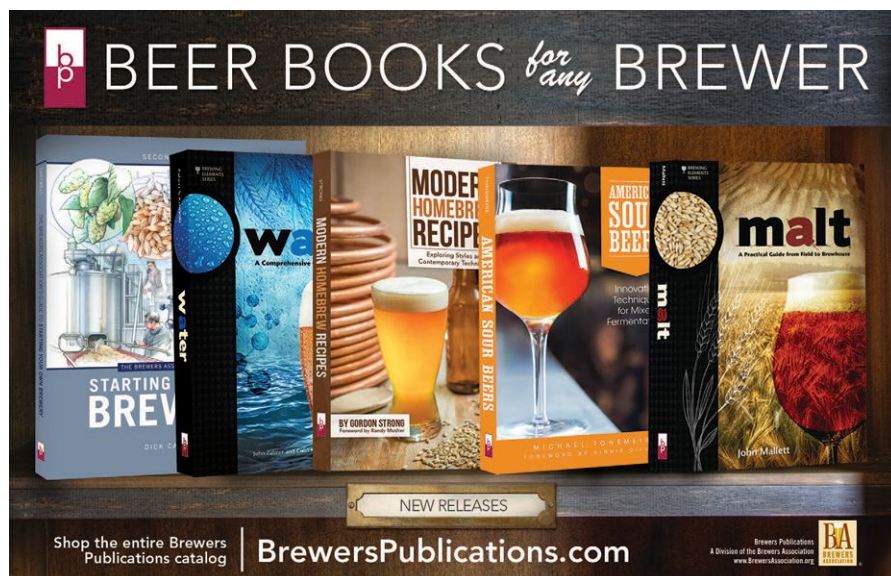
*Honey* 1.030

*Pale malt (mashed)* 1.025-1.028

*Crystal malt (steeped)* 1.016

Multiply the number of pounds of each ingredient by last two numbers of the original gravity listed above. Then, since these are for 1 gallon only, divide by the number of gallons you will be brewing. Let's say you are making a 5-gallon batch of honey lager. You are using 3.5 pounds of light malt extract syrup, 1 pound of honey, and are steeping a half a pound of crushed, 10L crystal malt. So for the extract, 5 times (1.0)34 = 170; for the honey, 1 times 30 = 30; and for the crystal malt, 0.5 times 16 = 8. Total extract is 170 + 30 + 8 = 208, divided by 5 gallons = 41.6, so you can expect an original gravity of 1.0416, or about 1.042.

**Amahl Turczyn is the associate editor for *Zymurgy*. He brews at home in Lafayette, Colo.** 





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- Key tips for beginners
- Equipment, recipes & ingredients to get started
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## National Homebrew Competition

Every year, the American Homebrewers Association organizes the National Homebrew Competition, the world's largest beer competition, in which thousands of beer entries from all over the world are judged. Awards are given to the top three entries in each of 28 style categories (from the BJCP's 2008 style guidelines). Some of these recipes use malt extract and follow simple brewing procedures like those you have already learned. The following beers were brewed by people just like you, mak-

ing beer at home for the fun of it—yet their finished product was rated by experienced beer judges as being the best homebrew in the country. These represent a few of the very best of the best. We hope that these gold medal-winning recipes will inspire you to try your hand at reproducing their championship creations. And who knows, maybe one day soon your own favorite handcrafted beer recipe will find its way into the elite ranks of Zymurgy's Winners Circle. 

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## Northern German Altbier

**GOLD MEDAL, AHA 2006 NATIONAL HOMEBREW COMPETITION**

Scott Miglin, Mt. Vernon, Ohio

"Strike Team Chanukah Altbier"

### INGREDIENTS

for 5 U.S. gallons (19 L)

<b>2.75 lb</b>	(1.25 kg) Munton's amber dry malt extract
<b>3.0 lb</b>	(1.36 kg) Munton's dark dry malt extract
<b>1.0 lb</b>	(0.45 kg) 60° L caramel malt
<b>2.0 lb</b>	(0.9 kg) dextrin malt
<b>1.0 oz</b>	(28 g) Magnum pellet hops, 13.5% alpha acid (boiled 60 min.)
<b>1.0 oz</b>	(28 g) Columbus pellet hops, 14.3% alpha acid (boiled 5 min.)
<b>1-2 packages</b>	(0.94 L) Wyeast 1007 German Ale yeast
<b>0.66 cup</b>	corn sugar (to prime)

**Original Specific Gravity:** 1.058

**Final Specific Gravity:** 1.020

**Boiling Time:** 60 minutes

### DIRECTIONS

Steep grains at 150° F (66° C) for 30 minutes in 1 gallon (3.8 L) of water. Strain out grains, add extract and bring to a boil. Boil for a total of 60 minutes, adding hops as indicated in the recipe. Strain into fermenter with 3 gallons (11.4 L) of cold water. Top up with cold water to make 5 gallons (18.9 L) total. When temperature drops to around 65° F (18° C), pitch yeast. Ferment for 5 days or until airlock activity ceases. If you have a second fermenter, rack to secondary fermenter and age 25-30 days, preferably cold (30-35° F/1-2° C). If you do not have a second fermenter, age another one to two weeks in primary fermenter before bottling. Bottle with 0.75 cup corn sugar.



## GLOSSARY

**Clean**—Denotes the absence of visible soil or debris.

**Dry Yeast**—A powdered or granular form of yeast that has been dehydrated.

**FG**—Final Gravity. The same as terminal gravity. A measure of the density of finished beer.

**Hops**—The green, cone-like flowers of a rapidly growing vine properly called *Humulus lupulus*. Hops impart bitterness to beer and, depending upon how they are used, can also impart a range of flavors and aromas to the finished product.

**Malt**—Short for “malted barley,” the cereal grain from which beer is made. Raw barley is malted by wetting it and allowing it to germinate. The grain is then dried so that it can be stored and transported for use by brewers.

**Malt Extract**—A solution of sugars and other compounds extracted from malted barley and used in the making of beer.

**Mash, mashing**—A thick combination of crushed malt with hot water designed to extract malt sugars and flavors. Unlike steeping, this process strives to activate the natural malt enzymes in order to maximize the conversion of starch into sugar.

**OG**—Original Gravity. The specific gravity, or density, of the wort prior to fermentation.

**Pitch, pitching**—The addition of yeast to wort to initiate fermentation.

**Rack, racking**—The process of transferring wort or beer from one container to another.

**Sanitize**—To treat with solutions that dramatically reduce the number of microorganisms present on a surface.

**Secondary Fermentation**—A second, slower stage of fermentation. Many beer styles benefit from aging fermented beer in a secondary fermenter. Beer is racked off trub from the first fermenter into a second fermenter and allowed to age an additional two weeks to several months.

**Steep, steeping**—Soaking of crushed grains in hot water to extract flavor components.

**Wort**—The boiled solution containing malt sugar and hops that is cooled and pitched with brewers yeast to produce beer.

**Yeast**—The single-celled organisms responsible for converting sugar into alcohol and carbon dioxide during the fermentation of beer and other alcoholic beverages.

## Spice Beer

### GOLD MEDAL, AHA 2002 NATIONAL HOMEBREW COMPETITION

Roger Gibson, Liberty, Mo.

“Summertime Ginger Ale”

#### INGREDIENTS

for 5 U.S. gallons (19 L)

<b>2.0 lb</b>	(0.9 kg) extra light dry malt extract
<b>1.0 lb</b>	(0.45 kg) clover honey
<b>4.0 oz</b>	(113 g) Belgian aromatic malt
<b>0.5 lb</b>	(226 g) lactose (added to boil)
<b>1.0 oz</b>	(28 g) Spalt whole hops, 2.5% alpha acid (boiled 45 min)
<b>2.0 oz</b>	(56 g) fresh chopped ginger (boiled 15 min)
<b>2.0 oz</b>	Wyeast 2565 Kolsch yeast (56 g) fresh chopped ginger root (in secondary, 7 days)
<b>0.75 cup</b>	(177 ml) corn sugar (to prime)

**Original Specific Gravity:** 1.028

**Final Specific Gravity:** 1.000

**Boiling Time:** 60 minutes

#### DIRECTIONS

Steep Belgian aromatic malt for 30 minutes in 1 gallon (3.8 L) of water while heating to 150° F (66° C). Strain out grains, add extract, honey and lactose and bring to a boil. Boil for a total of 60 minutes, adding hops and ginger as indicated in the recipe. Strain into fermenter with 3 gallons (11.4 L) of cold water. Top up with cold water to make 5 gallons (18.9 L) total. When temperature drops below 70° F (21° C), pitch yeast. Ferment for 5 days or until airlock activity ceases. If you have a second fermenter, rack to secondary fermenter and age 10 days, adding remaining ginger during the last 7 days. If you do not have a second fermenter, add ginger directly to your primary fermenter after fermentation ceases and age 7 days. Bottle with 0.75 cup corn sugar.

## Belgian Dubbel

### GOLD MEDAL, AHA 2009 NATIONAL HOMEBREW COMPETITION

Phil Keener, Ashland, Ohio

#### INGREDIENTS

for 5 U.S. gallons (19 L)

<b>6.6 lb</b>	(3.0 kg) Muntons light liquid malt extract
<b>2.0 lb</b>	(0.9 kg) extra light dry malt extract
<b>1.0 lb</b>	(0.45 kg) Belgian candi sugar
<b>0.25 cup</b>	(59 ml) maple syrup
<b>2.0 oz</b>	(57 g) Cascade hops, 5.75% alpha acid (60 min)
<b>1.0 oz</b>	(28 g) Cascade hops, 5.75% alpha acid (5 min)
<b>2 packages</b>	Wyeast 1214 Belgian Abbey ale yeast
<b>5.0 oz</b>	(142 g) corn sugar (to prime)

**Original Specific Gravity:** 1.068

**Final Specific Gravity:** 1.012

**Boiling Time:** 60 minutes

#### DIRECTIONS

Bring 1 gallon (3.8 L) of water to a boil. Remove from burner and stir in extract, candi sugar and maple syrup. Boil for a total of 60 minutes, adding hops as indicated in the recipe. Strain into fermenter with 3 gallons (11.4 L) of cold water. Top up with cold water to make 5 gallons (18.9 L) total. When temperature drops below 75° F (24° C), pitch yeast. Ferment for 10 days at 70-72° F (21-22° C) or until airlock activity ceases. If you have a second fermenter, rack to secondary fermenter and age 30 days. If you do not have a second fermenter, age another one to two weeks in primary fermenter before bottling. Bottle with 5.0 oz (142 g) corn sugar.



# Becoming a Zymurgist

I started homebrewing because when people at beer fests and book events asked if I brewed, I grew tired of answering “no.” For three years, I soaked up beer culture through breweries’ histories and brewers’ stories. I lit out on a journey to write a book about the American craft beer scene. My “research” led me on a 10,000-mile odyssey to meet (and drink) with the owners and employees of 14 breweries—1 percent of the domestic market at the time—to catch a glimpse of the brewing arts.

I say arts because as someone who can neither paint nor draw nor sing nor even score very high on “Rock Band,” I’ve always applied my one artistic merit, writing, to those who create.

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Furthermore, I can cook but I can’t bake. When it comes to that exact science, particularly when a recipe calls for baker’s yeast, I wind up with a clump of dense dough that doesn’t rise.

With several great books already out there on the science and mechanics of brewing, I was solely interested in the human aspect. Besides, I suck at science. When you make a mistake in storytelling, it’s easy to edit. That’s what the delete button is for. When you err in science, say, zymurgy, the drain is your delete button.



After the book was published, what I encountered at author events throughout the country—this time rolling 13,000 miles—was a tremendous, emphatic homebrewing community. The one question I got more than “Did you make it to (insert favorite brewery)?” or “Why didn’t you visit (insert same favorite brewery)?” was “Do you homebrew?” I explained that my mission was to meet the men and women who brew professionally so that all of us who don’t brew at home are able to stay plied with great beer.

I could not ignore, however, that I’m blessed with having a homebrew supply shop a few blocks away. And a large closet. And a tolerant—even supportive—girlfriend.

So I made the leap from ale enthusiast to homebrewer. If nothing else, I now better understand the difficulty and potential mishaps so as to gain even more respect for brewers, both the pro and home variety. Now when people ask me the “do you” question, I answer



yes, as I have just bottled my first batch, a sessionable Extra Special Bitter. Batch No. 2 is perhaps overly ambitious for a newbie. I’m attempting a Latte Stout, tossing lactose and coffee beans in the mash, and I’ve been advised to percolate some coffee in case it’s needed during secondary fermentation.

My girlfriend loves stouts and lattes. And I may just draw her into the act this way.

This is all “research” for my next book project, which is not only about beer, but hits closer to home.

Transitioning from beer fan and writer to zymurgist (which I label myself with great humility for fear of denigrating all those who do it so well), I’m embracing what we all know about brewing: that it’s both an art *and* a science.

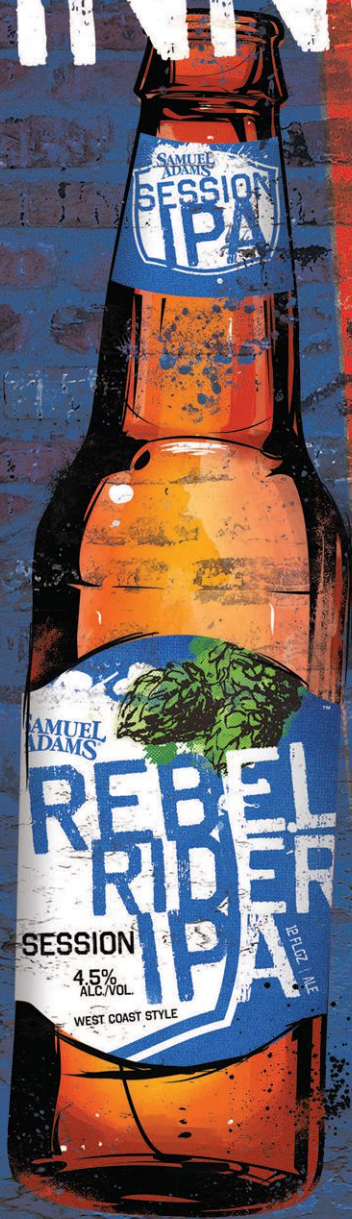
**Brian Yaeger is the author of *Red, White, and Brew: An American Beer Odyssey* (St. Martin’s Press). He blogs at [brianyaeger.com](http://brianyaeger.com).**

Photos courtesy of Brian Yaeger

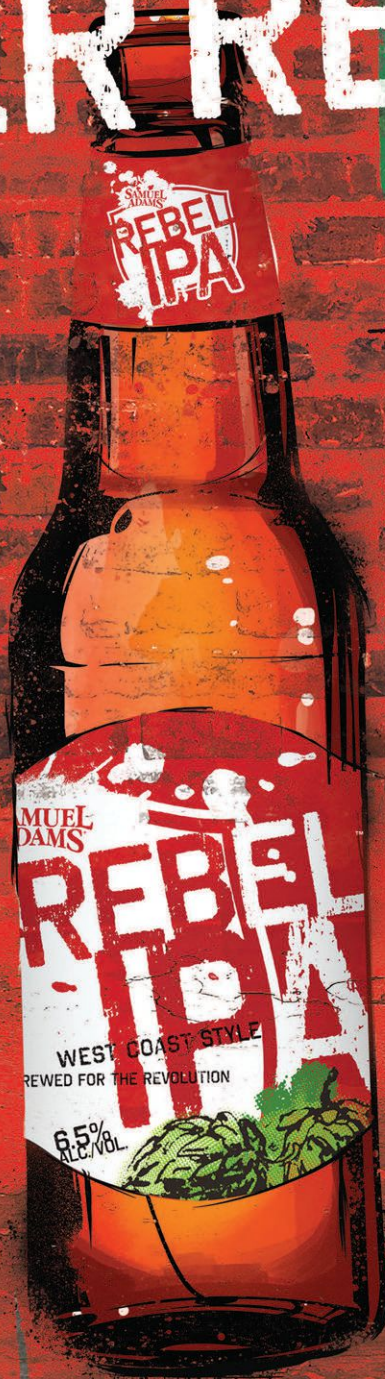


unleash your

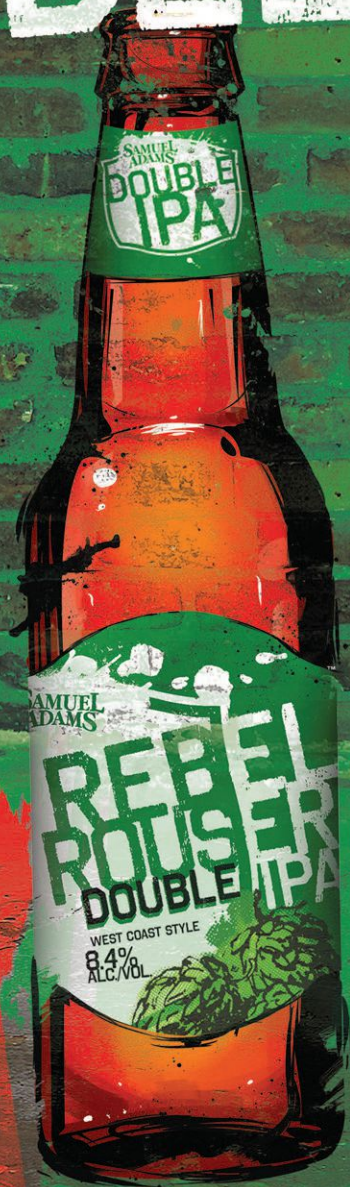
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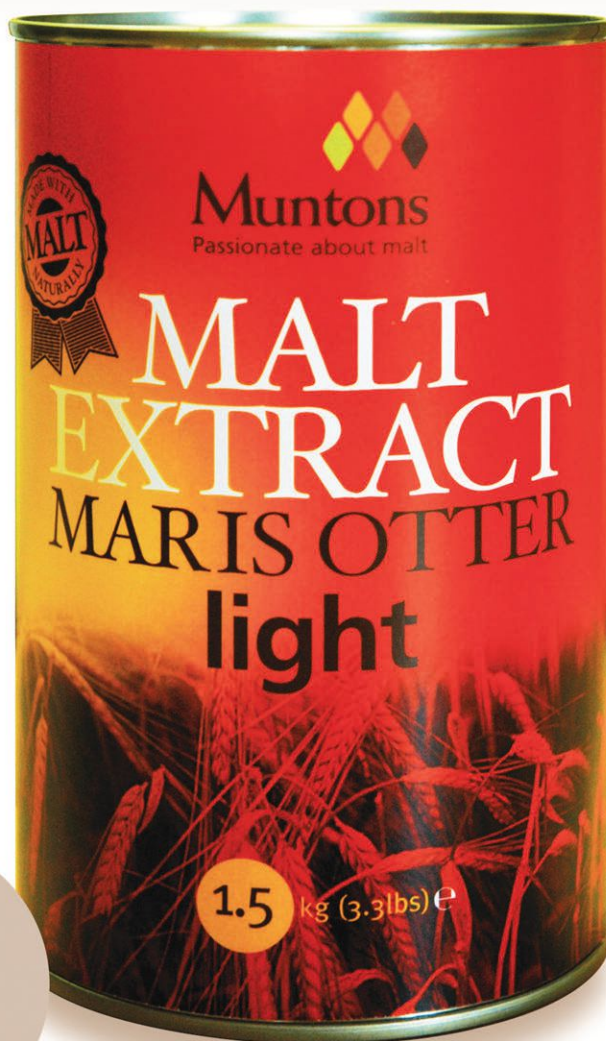
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