

# Brew

**YOUR OWN**

March 1998, Vol. 4, No. 3  
The Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

***PUCKER UP! WAY HOPPY BEERS***

**24 Cool Tips  
and Rules  
of Thumb**

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Batches Like  
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\*This recipe is for the 5 US gallon (19 litre) kit. Get in touch and we'll send you the  
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## Rules of Thumb

**A**ny activity is easier if you begin with a few basic guidelines. That's why this month we're concentrating on rules of thumb for brewing. Here are a few you should know about.

**The Flub Factor:** You're three times more likely to drop a brewing utensil on the floor immediately after you sanitize it than at any time before you sanitize it.

**Full-Calendar Syndrome** (a temporary disability usually associated with moving day) is 12 times more likely to strike your friends on bottling day than on the day you taste your latest batch.

To avoid using the wrong amount of an ingredient or leaving one out entirely, never use a recipe.

The amount of stress your spouse feels over the mess you make and the time you spend in the kitchen is inversely proportional to how well your spouse liked your last batch.

A good batch of beer and a mediocre one will last the same amount of time, but the consumption rate will vary as you reach the last bottles. Say, for instance, you have a six-pack of homebrew and a six-pack of commercial beer left in the fridge. If you drink two beers a day, the consumption pattern will look like this:

Beers in Fridge							
	Day 1	2	3	4	5	6	7
Good homebrew	6	4	2	2	2	1	0
Commercial beers	6	6	6	4	2	1	0
Mediocre homebrew	6	6	6	4	2	1	0
Commercial beers	6	4	2	2	2	1	0

On a related note, the fewer beers you have left, the better they taste.

**The Friendly Fire Ratio:** Expect to spill one pint of wort for each person, above one, who participates in the brewing session. Gather 40 of your closest friends to help you brew and

you'll lose the entire five-gallon batch.

**For outdoor brewers:** For every fly that lands in your mash, extend the protein rest by three minutes.

Mathematics can be helpful in brewing. If you're a first-time brewer, use the following formula to determine how much beer to make:

Number of Friends You Have Now x 2.5 x How Much Beer They Can Drink

Divide the result by 5 gallons. Now you know why so many brewers urge their friends to take up the hobby!

If you want more rules of thumb — some actually more pragmatic than these — check out the story "24 Brewing Tips and Rules of Thumb." It's written by John Oliver, a longtime homebrewer who has experience in the homebrew retail business and is now a professional brewer. John takes a practical approach, offering plenty of ideas and suggestions to make beer better, brewing more efficient, and the whole process more fun.

The story begins on page 38.

Finally, just a reminder that the deadline is approaching for our annual extravaganza, the BYO Gonzo Label Contest. Get your entries in by March 16. For a little inspiration, we have a story this month with tips on creating your own labels ("Making Great Labels," page 51).

There's only one rule of thumb for the label contest: the more creative and the more original, the better. We have some great prizes this year, and we'll feature the winners in our June issue. The entry form is on page 17. Remember, the deadline is March 16.



# Brew

YOUR OWN  
THE HOW-TO HOMEBREW BEER MAGAZINE

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**EDITORIAL ASSISTANT** Julie Slama

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**CONTRIBUTING WRITERS** Alex Fodor, Nico Freccia, Stan Hieronymus, Daria Labinsky, Scott Russell

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**PUBLISHING ASSISTANTS** Frank Bernard, Katie Landau

**WEB MASTER** Heidi Larson

**CIRCULATION CONSULTANT** Maureen Kaminski

**PUBLISHER** Carl B. Landau

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## Mountain-Top Brewing

**Don Blake**  
Longmont, Colo.

Eight members of the Tribe Homebrew Club of Longmont, Colo., brewed a batch of beer on Colorado's highest peak, Mt. Elbert (elevation 14,433 feet), on August 30 last year, in an endeavor they termed Operation: Hypoxia.

The six-man, two-woman, and two-dog team packed all the brewing equipment, beer ingredients, and water up to Mt. Elbert's summit. There they brewed a batch of barleywine, pitched the yeast, and carried it all back down.

According to the American Homebrewers Association this is believed to be the highest recorded elevation at which any beer has been brewed in the Western Hemisphere.

The underlying purpose of this endeavor was to demonstrate the simplicity of homebrewing and prove



*The eight highest brewers in the Western Hemisphere.*

that beer can be brewed just about anywhere by anyone.



*Porter keeps a close eye on the action, hoping a few drops might spill.*

### Four-Legged Brew Partners

We have a nine-month-old puppy that is black Labrador/German shorthair pointer/chow. She helps my husband and me brew. We named our puppy Porter. (Stout was my husband's first choice.)

Not only is Porter around to help with the brewing but also the drinking. She knows that the sound of a bottle opening means it's beer time. Porter loves to sample the various beers that we have brewed. She is now able to drink on her own by tipping the bottle with one paw and lapping up the beer. (She is only given a small amount from the bottom of the bottle.)

*Curt and Kathy Stock*  
St. Paul, Minn.



*Boomer was a loyal brewing partner before being laid to rest recently at the age of 10. In his honor owner Daniel Smith and his wife donated a BYO subscription to their friends at Orchard Mesa Veterinary Clinic in Grand Junction, Colo.*

### STRANGE BREWPOTS!

Do you have a strange or unusual brewpot? Tell us about it and send us a picture of you and your pot. There's a cool BYO T-shirt in it for you. Send your story to Pot Shots, c/o Brew Your Own, 216 F Street, Suite 160, Davis, CA 95616. Or send us e-mail at [edit@byo.com](mailto:edit@byo.com). Be sure to include your mailing address!



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Editorial and Advertising Office:  
Brew Your Own  
216 F Street, Suite 160  
Davis, CA 95616

Tel: (530) 758-4596  
Fax: (530) 758-7477  
E-Mail: BYO@byo.com

Advertising Contact:  
Evan Shipman, Ad Manager  
ad@byo.com

Editorial Contact:  
Craig Bystrynski, Editor  
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## Fermentation

Dear Brew Your Own,

If a recipe says that beer should be fermented for 10 to 14 days then bottled, does this mean that I don't take it off the yeast and just siphon, and then bottle with primer? Or do I still take it off the yeast within 10 to 14 days, then transfer to secondary fermenter until it reaches a stable final gravity?

Milton Koch  
Potomac, Md.

*After 10 to 14 days, when a stable gravity is reached, siphon off the yeast and bottle.*

## How Much Sugar?

Dear BYO,

I recently purchased five-gallon kegs. I'm not sure how much corn sugar to add for carbonation.

Mike Thomas  
Bethlehem, Pa.

*The amount of corn sugar is the same as when bottling — 2/3 to 1 cup per five-gallon keg. Use more or less depending on the desired carbonation level (more corn sugar produces more carbonation).*

## Conversion Confusion

Dear BYO,

When I picked up your January '98 issue, I was excited to see an article on converting between all-grain and extract recipes ("Extract to All-Grain and Back"). I have been pondering this question recently.

Overall, I found it an excellent article, especially the tables and the step-by-step examples. There are two points, however, where either I am confused or the information was inconsistent.

First, the value of 36 points is generically used as the maximum extraction value for all grains, despite the fact that the table indicates that wheat malt, for example, has a value of 38 points. Second, the All-Grain to Extract example lists the extraction



ratio as extract/grain. It seems that given the mathematical logic laid out earlier in the article (and the fact that converting from extract to grain used the extract/grain ratio), the ratio should be inverted, i.e., grain points/extract points.

Sean Drummond  
San Diego, Calif.

*You are correct. The equation should have read grain/extract and the equation for wheat should have used 38 points as the chart indicated. Thank you for bringing the discrepancy to our attention.*

## Grain Mill

Dear BYO,

I just received the January '98 issue. As always it was packed with lots of great stuff. What I'm most curious about is the malt mill that is shown on the front cover. It looks quite similar to a pasta machine that's been converted to a grain mill (at least for a photo session).

Is this a real working model or just a prop?

G.S. Gluskin  
Lombard, Ill.

*The mill is indeed a working model made in Italy by Marcato. This style, the Marga Mulino, is available from local homebrew stores or mill retailers. To find a store in your area, contact importer SCI, Camarillo, Calif., at (805) 482-0791.*

## More on Mashing

Dear BYO,

There was an error in the "Starter Guide to Mashing," (January '98). Sparge water should be 168° not 150° F. The higher temperature should be used to better rinse the dissolved sugar from the grains. Although 150° F will work, extraction efficiency will suffer.

Tom Venneman  
Alexandria, Ky.



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# A Truly Nutty Beer

by Scott R. Russell

A couple of summers ago I was judging at the Samuel Adams-sponsored World Homebrew Competition just outside of Boston. Everybody was having a good time making fun of the beers Jim Koch had just released under the Longshot label, the winners of the previous year's competition, especially the Hazelnut Brown Ale. Comments ranged from, "Where did he find enough hazelnuts to get that flavor?" to "Did he put any ale in there with the hazelnuts?"

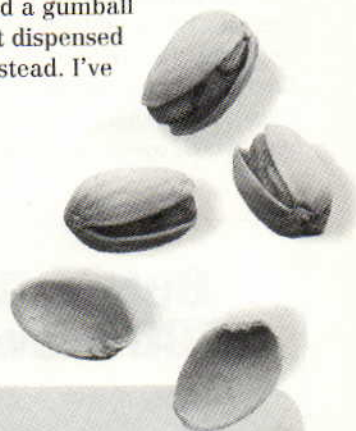
Now, I kept my mouth shut. Partly, it's true, because it was my first real official homebrew judging event. But partly also because I really liked the beer. I love nut flavors, in breads, cookies, candy, coffee, and in that case, beer. In Europe hazelnuts are used everywhere we use peanuts in this country. My years living in France made me really appreciate the rich flavor hazelnuts give to chocolate, coffee, even fruits, and I had

brought home on at least one occasion some French hazelnut liqueur as a souvenir.

Back to the competition. I listened to the discussions, as the more experienced judges speculated on what the brewers had used to get the nut flavor in there and to get it so intense. I went sideways. The method was less important to me than its implications. If it could be done with hazelnuts, could it be done with other nuts?

No matter what else I have said in the more than two years that I've been writing this column, no matter what other claims I might have made, let me set the record straight here and now, once and for all. If I have my choice of flavors, for ice cream, candy, snack food in general, I will always, without hesitation, choose pistachios. Maybe it's because of the little Italian man

outside Fenway Park selling fresh roasted peanuts "and pistachios," he would add, seeming to look at me as he said it. I always bought pistachios from him when I went to the game with my dad. Maybe it was because of the local country dairy/ice cream stand we drove to on hot summer nights, where they served a pistachio ice cream with whole nuts hidden among the green ice cream. And the barber shop where Dad took us every few Saturday mornings to get our hair cut. This shop had a gumball machine that dispensed pistachios instead. I've



## Helles Belles (5 gallons, partial mash)

### Ingredients:

- 3 lbs. pilsner malt
- 0.5 lb. Vienna malt
- 0.5 lb. cara-pils malt
- 3 lbs. extra-light unhopped dry malt extract
- 2 oz. Tettnanger hop pellets (4% alpha acid), for 45 min.
- 2 cups shelled whole, unsalted pistachios
- 4 oz. grain alcohol or vodka
- 1 qt. Munich lager yeast slurry (Wyeast 2308)
- 3/4 cup corn sugar for priming

### Step by Step:

A few weeks before you brew, finely crush pistachios and soak in vodka in a tightly sealed jar. Heat 1.5 gal. water to 167° F, and add crushed grains to water in

mash tun. Mash should settle near 156° F. Hold 90 min. Begin runoff and sparge with 2 gal. of water at 168° F.

To kettle add dry malt extract and bring to a boil. Boil 30 min. and add hops. Boil 45 min. more for a total boil of 75 min. Remove from heat and cool. Top off in fermenter to 5.25 gal. with chilled, pre-boiled water. At 68° F, pitch yeast slurry and cool overnight to 50° F.

Ferment near 50° F for 10 days, then rack to secondary. Add half of the liquid from the pistachio jar (strain particles out, returning them to the jar) and chill to 38° F. Lager at 38° F for six weeks. Prime with corn sugar, add remaining pistachio tincture (straining out particles) and bottle. Store at room temperature

for three to four days, then age cold (33° F) for four more weeks.

### Brewing Notes:

**All-grain brewers:** Instead of the dry malt, mash 6 lbs. pilsner, 1 lb. Munich, and 1 lb. cara-pils in 3 gal. water (same temperatures, same time) and sparge with 4 gal. water. Plan boil to condense to 5.25 gal. and hop as above.

**All-extract brewers:** Steep 0.25 lb. toasted Vienna malt (toasted on a cookie sheet at 350° F for 10 min.) and 0.25 lb. cara-pils in kettle until water reaches 170° F, then remove. Use 6 lbs. extra light dry malt extract. Follow hopping and boiling schedule as above.

And sure, you could use any nuts you like in this recipe.



always had a tender spot for pistachio pudding, too. Even the artificially flavored kind.

But in a beer, you ask? Uh-huh. In a beer, a light one, one that will showcase the flavor of the nuts and yet not submit utterly to them. A beer rich and yet subtle, hopped and yet not excessively bitter. I chose to try pistachios in a Munich helles. And I've never regretted it.

The biggest difficulty, of course, was how to get the pistachio flavor out of the nuts and into the beer. I didn't know of any pistachio-flavored extract or liqueur I could use, so I knew I would have to go directly to the nuts themselves. I ended up grinding them in a coffee grinder and soaking the pistachio flour in pure grain alcohol for a month, then straining this (through a coffee filter) and adding it, half to the secondary and half at bottling with the priming sugar. Straining removed the particles and made the mixture less oily. And not only did it extract the pistachio's nutty flavor, it also gave a slight greenish hue to the beer, which was an interesting twist as

well. And no, it doesn't fit under the Reinheitsgebot, sorry.

### Reader Recipes Strawberry Golden Ale (5 gallons, extract)

Like Pete's Wicked Strawberry Blonde, only better.

Jason Fox  
Cottage Brewing Supply  
Rochester, N.Y.

#### Ingredients:

- 7.5 lbs. Munton's light syrup
- 5 lbs. frozen strawberries
- 1 oz. Northern Brewer leaf hops (9.3% alpha acid), for 60 min.
- 1 oz. Willamette hops (4.2% alpha acid), steeped for 2 min.
- 1 tsp. Irish moss, last 15 min. of boil
- Wyeast 1272 (American Ale II)
- 3/4 cup corn sugar to prime

#### Step by Step:

Boil syrup and Northern Brewer hops for 60 min. Full boil is 60 min.

Steep Willamette hops for 2 min. after boil. Remove hops and add strawberries. Hold for 20 min. at 156° F. Cool wort to 70° F and transfer wort and strawberries to primary. Pitch yeast.

Ferment for 10 days in carboy. Transfer to glass secondary for one month. Prime with corn sugar.

OG = 1.049  
FG = 1.007

### Big Henry's Beamish Irish Stout (5 gallons, partial mash)

Note that there is no finishing, or aromatic hop addition at the end of the boil. We prefer to smell the rich maltiness.

John Daume  
The Home Beer, Wine &  
Cheese Making Shop  
Woodland Hills, Calif.

#### Ingredients:

- 4 lbs. Royal light dry malt extract
- 8 oz. corn sugar
- 12 oz. roasted barley
- 4 oz. Franco-Belge cara-wheat

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- 4 oz. chocolate malt
- 4 oz. Gambrinus ESB malted barley
- 0.6 oz. Northdown leaf hops (9.4% alpha acid), for 60 min.
- 1.75 oz. Styrian Goldings leaf hops (3.7% alpha acid), 1.25 oz. for 60 min., 0.5 oz. for 15 min.
- 1 tsp. Irish moss
- 2 tsp. calcium carbonate
- Wyeast 1084 (Irish ale)
- 3/4 cup corn sugar for priming

#### Step by Step:

In 0.5 gal. of water heated to 170° F, mash grains. Turn off heat, cover for 45 min. Sparge with 0.5 gal. of 170° F water.

Top up to 3.5 gal. of water, add dry malt and sugar, and bring to a rolling boil. Add calcium carbonate. Skim all foam before starting hop sequence. (Add hops with the lid off.) Add Northdown and 1.25 oz. of Styrian Goldings and boil for 40 min. Add Irish moss and boil 5 min. more. Add 0.5 oz. Styrian Goldings and boil 15 min. more. Total boil is 60 min. Transfer to

primary and top up to 5 gal. Pitch yeast between 70° and 80° F.

Ferment between 68° and 72° F for one week. Transfer to secondary mid-fermentation or when head starts to break up. Ferment until complete, then prime and bottle.

#### Guinness Clone (6 gallons, extract and specialty grains)

This simple extract/grain recipe began as an attempt to clone Guinness Pub Draught and ended up a strikingly close copy of Guinness Extra Stout. Gotta love that hit and miss sometimes. This recipe took third place in the dry stout category in a local competition — a pleasant surprise, since all I expected was a critique of my beer.

*Michael Brown  
Sacramento, Calif.*

#### Ingredients:

- 7 lbs. Alexander's dark extract
- 0.75 lb. crystal malt, 80° Lovibond
- 1/3 lb. black patent malt
- 1/3 lb. roasted barley

- 2.5 oz. Willamette whole hops (5.1% alpha acid), for 60 min.
- Wyeast 1084 (Irish ale)
- 2/3 cup corn sugar for priming

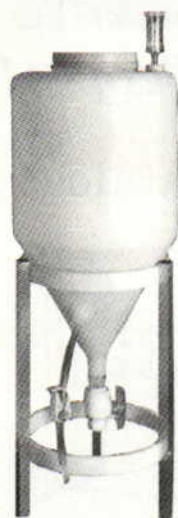
#### Step by Step:

Steep grains in grain bag in 3 gal. of filtered water for 20 min. at 155° F. Remove bag and bring to a boil. Add extract and hops. Boil 60 min. Remove hops and cool wort. Rack to primary and top up to 6 gal. Pitch yeast at 70° F and ferment for seven or eight days. Rack to secondary and leave for seven days. Keg or bottle with corn sugar and condition for seven days. ■

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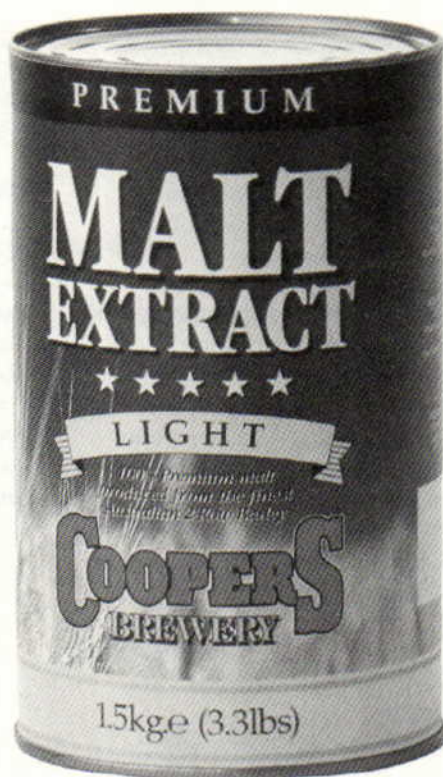
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## In Search of a Good Head

Mr. Wizard

I've been having a hard time bottling my carbonated beer with a CO<sub>2</sub> setup a friend gave me. I have the CO<sub>2</sub> bottle, regulator, hoses, five-gallon soda kegs, and a counter-pressure bottle filler. The beer seems okay when I carbonate it, but it doesn't hold a good head. Just lots of foam at first before it goes flat. When I try to bottle it, I get a lot of foam in the bottle.

My friend who sold it to me said to pressurize the beer at 30 psi for three to five days at 40° F. Then let off the pressure and force bottle at five to seven psi. Also, to help cut down on foaming I should chill all hoses and set my bottles in the freezer for a few minutes before bottling.

Can you give me any tips on filling my bottles without making foam? That is, how much pressure should I use and for how long when carbonating the beer? What pressure should I use to store the beer, and what technique should I use to fill the bottles?

James Golla  
Pearland, Texas

A counter-pressure bottle filler is designed to deliver a carbonated product into a bottle without excessive foaming. The basic idea behind these devices is to first pressurize the beer bottle to the same pressure as the keg holding the beer. After the bottle is pressurized and the beer valve allowing beer to enter the bottle is opened, the beer will only begin to flow if the keg is placed higher than the bottle.

The beer flow will stop quickly as the forces pushing it from the keg and those slowing it from entering the bottle become equilibrated. When this happens, the bottle vent is opened and

the beer flow will continue until the bottle is full. Then, the pressure in the bottle is slowly relieved and the filler is removed from the bottle. If everything went right, there is little foam coming out of the bottle and a cap can be quickly placed on the bottle.

In your case not too many steps seem to be going very well! What I would check first is the length of the fill tube.

One of the most important rules of bottle filling is to gently fill the bottle.

There are two types of filler-tube designs used in commercial breweries: long-tube and short-tube fillers. Short-tube fillers fill the beer by directing its flow to the inside walls of the bottle, and the beer cascades down the sides of the bottle during filling. Long-tube fillers extend all the way to the bottom of the bottle and allow the beer to fill from the bottom up without excessive turbulence. Your filler is a long-tube design,

and the fill tube should come to within one-half inch of the bottom of the bottle. If the tube ends farther from the bottom, the beer will start to foam as it falls from the bottom of the fill tube to the bottom of the bottle. If your fill tube is too short, extend it.

The next rule of bottling is that beer foam breeds more beer foam. This is because gas is released from beer when nucleation sites are present. Nucleation sites include rough spots on a beer contact surface, such as an etched glass, crystals in beer (for example when salt is added to beer), and beer foam. Toward the end of filling the bottle, leave some space at the top and do not allow any beer to

squirt out of the gas vent valve. If the bottle is filled all the way up, beer will squirt out of the vent tube during the depressurizing step and foam will form. If you allow beer to squirt out of the vent tube during filling, foam will form. In both cases more foam will form when you remove the fill tube. This rule applies not only to filling beer bottles at home but is also used in commercial bottle machines. In fact the fill tubes on a commercial filler are designed so that beer cannot be filled all the way to the top of the bottle.

On the same line of reasoning, the beer bottle itself is often the culprit of foaming, especially when returnable bottles are used for bottling. Glass is not a smooth surface and the surface imperfections in glass make beer foam. When beer bottles are cleaned and re-used at the brewery, the surface of the bottle becomes etched and this problem is exacerbated. Filling a wet bottle is easier than filling a dry bottle because a film of water on a bottle's surface is smoother than a dry surface and, you guessed it, results in less foaming. Commercial filling lines have a bottle rinsing preceding the filler to ensure that beer is filled into wet glass.

These rules are the basics of bottling and when used on most beers things usually go pretty well. If I sound a little unsure, it's because bottling usually provokes brewers to swear a bit more than do other operations. Bottling beer is never a sure thing. Two variables that often throw a kink into the mix are beer carbonation level and beer temperature. As a rule, highly carbonated beer and warm beer are both difficult to bottle. In your case you are dealing with both!

By pressurizing your beer keg to 30 psi and holding it at 40° F for three to five days, you are grossly over-carbonating the beer. If you want a normal level of carbonation at 40° F, reduce your pressure to 14 psi and follow the same procedure. Many brewers like





using higher pressures to carbonate beers more quickly and will use pressures in the 30 to 40 psi range in combination with keg shaking for a couple hours. I prefer to choose a pressure and temperature combination that results in the carbonation level I am after and allow the beer to carbonate over several days. This method is more predictable and reproducible than high-pressure carbonation followed by a reduction in keg pressure.

As far as temperature is concerned, 40° F is fairly warm. The closer you get your beer to freezing the easier it will be to bottle. Remember to carbonate at a lower pressure if possible since beer can hold more carbon dioxide in solution as temperature decreases. If you can reduce the beer temperature to 32° F, use 10 psi for the same level of carbonation.

The last bit of advice I can offer is that your bottling pressure of five to seven psi is too low. At a fixed temperature and fixed carbonation level in a closed vessel, beer has an equilibrium

head pressure. These are the variables that affect beer carbonation. If the keg pressure is reduced after establishing an equilibrium state, then the system responds to re-establish equilibrium. During bottling, this will result in carbon dioxide gas escaping from the beer as it flows from keg to bottle. If you leave the pressure on your keg the same as that used for carbonation, this problem will go away.

**Mr. Wizard**

**What are your thoughts on batch sparging vs. using a rotating sparge arm?**

*Bruce Barkett  
Tucson, Ariz.*

**M**y thoughts on batch sparging vs. continuous sparging are like my thoughts on the hundreds of other issues in brewing. In a nutshell, there's more than one way to remove the integument from a feline. I have used both methods on large and

small scales, and each of the methods has its merits. Batch sparging is easier because it is done only two or three times during the lautering process. If sparge water temperature and sparge water volume are important to a brewer, then batch sparging allows for the simple delivery of a certain volume of water at a specified temperature to the lautering tun. The downside to batch sparging is that the added volume of water on top of the grain bed induces more head pressure than continuous sparging and may compact the mash bed, which will extend the time required to collect the wort.

Continuous sparging minimizes the head pressure due to sparge water but requires more equipment and more attention to the sparging process. To sparge continuously, the flow of wort leaving the lautering tun and the flow of sparge water entering the lautering tun should be the same. Since the flow of wort leaving the lautering tun changes with time, so must the flow of sparge water. Unless a homebrewer invests

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entirely too much money into his system, this balance of wort and sparge water flow requires careful attention. This attention should have a payoff, and some argue that the lauter process time is decreased by the method. If homebrewing is about fun and relaxation, then I question the importance of shaving 10 or 15 minutes off of a brew day.

Continuous sparging also requires an insulated vessel to hold the sparge water at sparging temperatures during the period of time required for wort collection. Batch sparging, on the other hand, requires nothing more than a pot to heat the water to sparge temperature and a ladle or small pitcher to gently pour the water over the grain bed.

At the end of the day, both methods work to rinse sugars produced in mashing from the mash bed.

**Mr. Wizard**

I clean my bottles after every use. When I am ready to reuse them I soak them in iodophor for 24 hours (how long do they really have to soak?), rinse them, and use them to bottle in the same day. I have never had a problem with this process, but I have a question concerning a bottle tree. I have heard that some brewers pour out the iodophor and place the bottles on a tree to drip dry and use them up to a week later. The second they come into contact with a bottle tree they are no longer sanitized, especially if they sit on the tree for a week. Would you recommend a bottle tree?

Scott Sutherland  
St. Louis, Mo.

Sanitizing bottles before use is definitely an important step in producing clean beers, and the use of an iodophor sanitizer is one of many effective products that will do the job. To answer the question on contact time, iodophors require no more than 30 minutes to effectively sanitize a surface when used at their recommended concentrations. An important point to always remember when using chemical sanitizers (as opposed to heat sanitation) is that residual soils will reduce a sanitizer's concentration and will decrease, if not completely eliminate, the efficiency of the product.

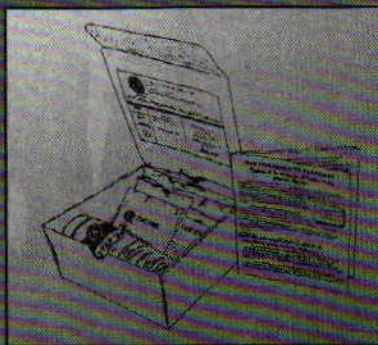
Your primary concern is the use of bottle trees and the issue of recontamination. Any sanitized surface can be contaminated after the sanitizing step, and contact with contaminated surfaces should be eliminated. Using a bottle tree does not necessarily pose a risk if the tree is kept clean and sanitized. If you soak your bottles in the iodophor along with the tree and place them to drain on the tree, you should be fine.

One step I would suggest eliminating is the rinse step after your iodophor soak. A sanitizing rinse or soak should always be the last step before use because the rinse water is capable of recontaminating the bottle surface. If the iodophor is used at a non-rinse concentration and allowed to drip off of the bottle surface, you won't have any problems from residual sanitizer.

After the bottles drain on the tree,

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they should be used immediately because iodophor sanitizers work on contact and have very little residual activity.

**Mr. Wizard**

I brewed my first batch approximately two weeks ago. To cool the wort I painstakingly placed two gallons of ice

into my fermenter before I poured the hot wort in. After half an hour I put in the yeast. I capped everything. Oops, I forgot to take a hydrometer reading. Nothing started to happen until 24 hours later. The fermenter cooked for three days then stopped. It's two weeks later and I haven't done anything to it. Should I throw the batch away and start over?

Keith Wagner  
Cincinnati, Ohio

**H**ydrometers are useful tools for gathering information about a brew. They give the brewer information about the initial wort gravity, indicate when the fermentation has stopped, and help determine other factors. But to the carboy full of wort and yeast, hydrometers do nothing.

Your first batch began fermenting after 24 hours as indicated by the head of yeast rising to the top of your fermenter and the rhythmic glug-glug of the fermentation lock. A hydrometer would have indicated a decrease in specific gravity, but that information would have merely confirmed that the carbon dioxide bubbling from the fermenter was a byproduct of yeast metabolism.

Three days later the soothing glug-glug had subsided and the yeast head had deflated into a thin film over the beer's surface. If you had used a hydrometer to measure specific gravity, you could have documented that the specific gravity had stopped dropping, would have concluded that the fermentation was complete, and that it was now time to let the yeast settle to the bottom of the fermenter. Hydrometers are useful because sometimes a brew that looks like it is finished fermenting really hasn't. Such stuck fermentations require a little coaxing by the brewer to send them to completion. In most cases, however, the yeast have packed up their tools and turned in for the night long before a hydrometer indicates that the fermentation is over.

Sample your beer and judge its flavor at this stage. If it does not taste sweet like wort and if it tastes like flat beer, it's time to prime, bottle, and wait for the next step. ■

**Mr. Wizard's Address**

Do you have a question for Mr. Wizard? Write to him c/o *Brew Your Own*, 216 F St., #160, Davis, CA 95616. Or send e-mail to [wiz@byo.com](mailto:wiz@byo.com).

*Mr. Wizard, BYO's resident expert, is a leading authority in homebrewing whose identity, like the identity of all superheroes, must be kept confidential.*

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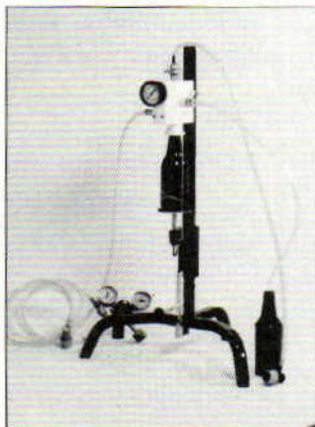
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CIRCLE 37 ON READER SERVICE CARD



## The Heat of Infusion Mashing

by Suzanne Berens

**Brewer:** Richard Young

**Brewery:** Castle Springs Brewing Co.  
Moultonborough, N.H.

**Years of experience:** Nine

**Education:** BA in criminal justice  
from Stonehill College, Easton, Mass.

**House Beers:** American Wheat Beer,  
Munich-Style Lager, India Pale Ale, Porter,  
Autumnfest, Winter Festival Ale

We have a two-vessel brewhouse, a mash/lauter tun with a brew kettle. So we are limited to single-step infusion mashing, which means using highly modified malts such as Canadian two-row is compatible for our purposes.

Single-step infusion involves mashing at one temperature. But we mash with different temperatures for different beers. In general, with the exception of our wheat beer, we create malty, full-bodied beers.

For example take our India pale ale. Many English brewers, and even some American brewers, use mash temperatures that are very low, 148° to 152° F. I use a lot of caramel malt. With a higher mash temperature, 155° to 156° F, I get more from the caramel malt, including more malty sweetness. This sweetness provides a nice balance for the large quantity of hops (at 65 IBUs) we use for the IPA.

We brew our porter in a similar fashion. We aim for very rich, malty flavor with a touch of sweetness. This brew has a starting gravity of 16° Plato or 1.064. Because higher mash temperatures tend to produce more dextrinous worts, we mash at 156° F to ensure that we will get enough unfermentables left over. Our FG is 5° Plato or 1.020; plenty of body and maltiness.

### Castle Springs Brewing Co.



"Many of today's malts are modified enough so that enzymes are released at one temperature, unlike undermodified malts, which need to be coaxed a little through step-infusion mashing."

**Brewer:** Richard Young

*Richard J. Young*

One of the most basic aspects of single-step mashing that homebrewers should focus on is consistency. Pay attention to the ambient temperature of your mash tun, your room, and the malt. If you store grain at 50° F and you bring it into an environment that is 70° F, you might get differences in your mash temperature. Also, try to keep your mash tun insulated.

When I was homebrewing I tried

to shoot for a mash temperature that was a little higher than required. It seemed easier to cool down a mash than to heat it up. If you are using a picnic cooler and you shoot for 155° F but accidentally get 148° F, the only way you can raise the temperature is by adding boiling water. But then you are changing the consistency of the mash. If you shoot for 155° F and instead reach 159° F,

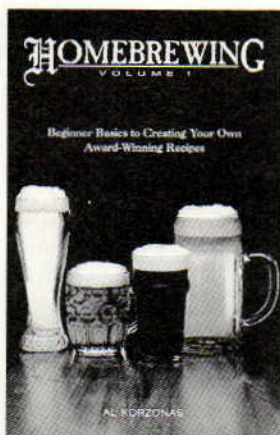
### The Tips

- Take into account the temperature of the mash tun, the room, and your malt.
- Keep your mash tun insulated.
- Buy well-modified malts such as

- Canadian and British two-row. It makes infusion mashing easier.
- Use different mash temperatures to affect your beer's body: higher for full body, lower for drier beers.



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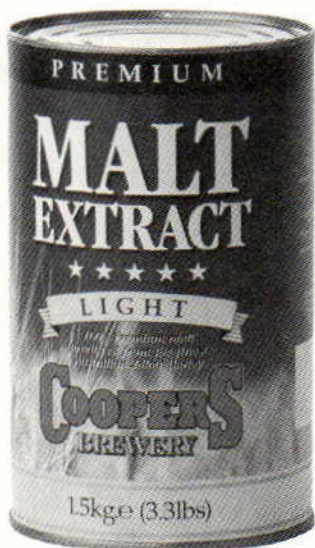
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## Tips from the Pros

you can cool the temperature by using a little less cold water than you would hot water to heat a mash that is too cool. You accomplish this by stirring. When you stir you want to fold — not splash — the wort like you're folding whipped cream or egg whites. This method only makes a small temperature difference, though.

You could also change the temperature by adding grain, but you would probably change your beer more that way than you would if you added water. When you add grain you are actually changing the balance of the beer, the grain bill. The total amount of sugars dissolved in the mash depends on the actual malt itself. So when you add a little cold water you're not changing the amount of sugars.

Now, there are limits to how much you can alter temperature without negatively affecting your finished product. I used to use a picnic cooler. If I was a degree or two off, I would stir gently until the temperature came down. If you're off by five degrees, that's a different story.

Say I want the mash temperature for my IPA to be 156° F. Would our beer at a 152° F mash taste completely different? Probably not. But the idea is consistency. At 152° F you still get plenty of fermentables and might even still hit the same target for your original gravity, but the blend between the fermentables and non-fermentables may be different. So, for example, say I were to mash our IPA at 152° F and it ferments down to 3.5° Plato, or 1.014 for the final gravity. Take that same brew and instead mash at 156° F; it may not reach an FG until around 4° Plato, or 1.016 FG. There's your difference. It may not be completely perceptible in hop and malt balance, but it might in other ways. The one at 152° F may have a drier flavor than the second. And that's directly related to the fact that fewer fermentables were left over after mashing at a lower temperature.

But most modified malts are flexible enough so that enzymes will be active at mashes as low as 146° F up to 158° F. It is not easy to deactivate enzymes with today's modified malts. Just be aware of the subtle differences caused by temperature variations. ■



# An American Classic

by Alex Fodor

*If barley be wanting to make into malt,  
We must be content and think it no fault,  
For we can make liquor to sweeten our lips,  
Of pumpkins, and parsnips, and walnut-tree  
chips.*

— American Poet, 1630  
from *Drinking in America*  
by Mark E. Lender and James Martin  
(Simon & Schuster)

The beer that came over on the Mayflower was probably a hoppy, alcoholic porter. How, then, could such a historically significant beverage end up as bland as the all-American beer, American pilsner?

When English settlers first came to America, they subsisted in large part on the fruits of their own labor. They grew their own fruits and vegetables, they sewed their own clothes, and they made their own beer.

Although barley grew well in the fertile soil of the New World, the landscape was barren of the skilled maltsters needed to make fine beer. Being the inventive people that they were, Americans managed to brew beer with the available ingredients.

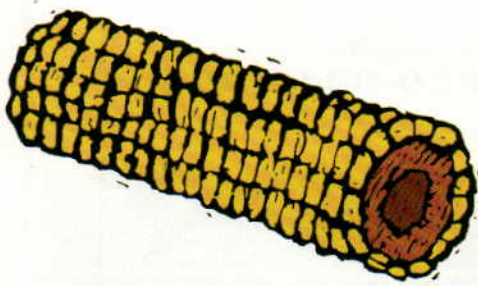
If you think it was the large nationals who ruined American beer, keep in mind that they were only following a precedent set by brewers like the above poet. Endemic to America, corn was surely among the beer ingredients tried by early American brewers. Unlike parsnips, corn was a starchy grain and good mash adjunct that resulted in a relatively inoffensive beer not to mention a potent bourbon.

America was a country of ale drinkers until 1840, when John Wagner, a German brewmeister, introduced lager yeast to Philadelphia. Sparked by a large influx of German immigrants, lager soon became the national favorite. The desire for a colder, lighter-tasting beer coupled with German brewing know-how resulted in a unique golden brew that would be the predecessor to

modern American pilsner. Of course most brewers were turning their backs on old *Reinheitsgebot* by including corn in their mashes. Nitrogen-deficient corn complemented the protein-rich six-row barley that was preferred by farmers and consequently reduced protein haze. Naturally high in diastatic enzymes, six-row malt beckons for the addition of enzymatically impotent adjuncts. Besides being cheaper than malt, corn also lightened the body and color of the beer while adding a subtle sweetness.

Breweries boomed across the United States, peaking at more than 4,000 in 1873. Consolidation resulted in the closings of many of these small breweries by the turn of the century. In 1920 Prohibition reared its head and put a damper on the whole industry, forcing many breweries out of business for good. After 13 long, dry years of Prohibition, breweries reopened in 1933 in the midst of Coca-Cola and the beginnings of mass marketing. In 1941 World War II worsened the situation by undercutting any pride American brewers still took in German brewing methods. A handful of large national brewers began to replace regional breweries. As one might expect, the domination of a few powerful breweries resulted in a less diverse beer selection for the consumer. Economics also drove national brewers to use a higher percentage of corn and/or rice in the grist, some as high as 65 percent.

This brings us to the beer with which we have grown up. While these beers are well made with a high level of control and consistency, they tend to lack in flavor. Compared with the earlier American pilsners, they are paler, lighter, less bitter, and less alcoholic. Brewing professor Michael Lewis of the University of California, Davis, likes to refer to them as "pain beer" for the sharp bite of the high carbonation.





Homebrewing American pilsner may be a frustrating experience. Because the final product has little in the way of flavor complexity, it also does not mask off-flavors very well. The key word here is clean. All of the equipment used must be kept very clean to avoid contamination and the resulting funk it can impart.

The ingredients for American pilsner are easy enough. You will need a grain bill of 60 to 80 percent six-row malt, with corn or rice making up the difference. The key to making your adjunct work for you is gelatinization. Gelatinization is the thermal decomposition of the starch molecule that allows amylase enzymes to attack. The gelatinization temperature of corn falls in the range of 143.5° to 165° F and is 142° to 172° F for rice. Traditionally brewers dealt with this by using the decoction-like American double mash method, which calls for the boiling of the adjunct.

For the double mash take all of the adjunct in the recipe and a small

amount of the total malt and mix with water. Ramp the temperature up to 158° F and hold for 15 minutes. Meanwhile, the rest of the malt is mashed in separately and held for a protein rest at 122° F. After the conversion rest the first mash is boiled for 15 minutes and then slowly added back to the second to raise the entire mixture incrementally to the range 155° to 158° F for a 30-minute conversion rest.

An easier alternative is to buy pregelatinized corn or rice flakes that can be used in a simple infusion mash. Extract brewers should look for hydrolyzed corn or rice syrups or powdered extracts to supplement a light-colored malt extract.

The original gravity of American pilsner should start at 1.038 to 1.048 and finish around 1.008 to 1.013. The alcohol content is 3.2 to 3.9 percent by weight or 4 to 4.8 percent by volume. With a color of 2 to 3 SRM, the brilliantly clear beer is a familiar shade of straw. Hop flavor should be kept to a

minimum. The typical bitterness level is 10 to 16 IBUs. Henry Weinhard's is one of the few American pilsners that has a recognizable hop aroma reminiscent of Tettnanger. Wyeast 2035, American lager yeast, is the obvious choice for this style. Ferment at 48° to 52° F and lager for six weeks.

### **Saturday Night Pilsner (5-gallons, partial mash)**

A low hop rate and unassuming ingredients guarantee this beer to be just like mass produced. I'll take a 24-pack of this easygoing pilsner any Saturday night.

#### **Ingredients:**

- 3 lbs. six-row malt
- 1.5 lb. flaked rice or corn
- 2 lbs. hydrolyzed rice syrup
- 1.5 lb. malt extract
- 1 oz. Tettnanger hops (4% alpha acid), for 60 min.
- Wyeast 2035 or other lager yeast
- 3/4 cup corn sugar for priming

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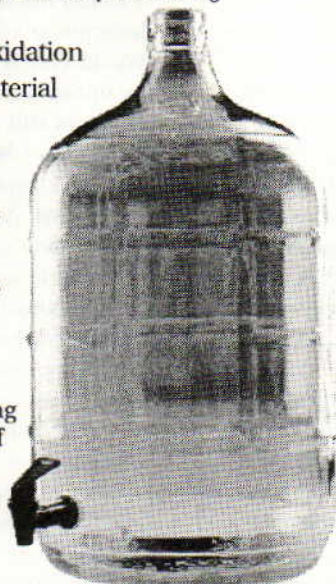
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### Step by Step:

Mash grains into 1.5 gal. of water. Raise temperature to 122° F and hold for 10 min. Slowly raise temperature at a rate of two degrees or less per min. to 152° F and hold for 45 min. Raise temperature to 170° F for mash-out. Sparge with 165° F water until 4 gal. of sweet wort is collected.

In a 7-gal. kettle, mix in the sweet wort, the extracts, and 2 gal. of water. Bring to a boil and add hops. After a 60 min. boil, cool and aerate the wort. Pitch yeast at 60° F and cool to 48° to 52° F for fermentation.

Lager four weeks before bottling.

OG = 1.043

FG = 1.009

### Cornheitsgebot Pilsner (5 gallons, all-grain, some corn)

This pre-Prohibition-style lager is brewed in strict accordance to the little-known American beer impurity law of 1840, better known as Cornheitsgebot.

#### Ingredients:

- 6.5 lbs. six-row malt
- 2 lbs. flaked corn
- 0.5 lb. Munich malt
- 0.5 oz. Perle hops (10% alpha acids), for 60 min.
- 2 oz. Hallertauer hops (4.5% alpha acids), 1 oz. for 30 min., 1 oz. for 15 min.
- Wyeast 2035 or other lager yeast
- 3/4 cup corn sugar for priming

### Step by Step:

Mash grains into 3 gal. of water. Raise temperature to 122° F and hold for 10 min. Slowly raise temperature at a rate of two degrees or less per min. to 152° F and hold for 45 min. Raise temperature to 170° F for mash-out. Sparge with 165° F water until 6 gal. of sweet wort is collected.

Bring to a boil and add Perle hops. Boil 30 min. and add 1 oz. Hallertauer hops. Boil 15 min. more and add 1 oz. Hallertauer. Boil 15 min. more for a total boil of 60 min. Cool and aerate. Pitch yeast at 60° F and cool to 48° to 52° F for fermentation.

Lager four weeks before bottling.

### Yankee Doodle Pils (5 gallons, extract)

Don't call it macaroni. It's Yankee

Doodle Pils, the hassle-free way to make American Pilsner.

#### Ingredients:

- 4.5 lbs. light malt extract
- 3.5 lbs. hydrolyzed rice syrup
- 1 oz. Tettnanger hops (4% alpha acid), for 60 min.
- Wyeast 2035 or other lager yeast
- 3/4 cup corn sugar for priming

### Step by Step:

In a 5-gal. pot bring 3.5 gal. of water to a boil. Stir in malt and rice extract. When boil resumes add hops. Boil for an hour. Top up to 5 gal. with cold water to help cool. Finish cooling and aerate. Transfer to bucket or carboy. Pitch yeast at 60° F and cool to 48° to 52° F for fermentation.

Lager four weeks before bottling. ■

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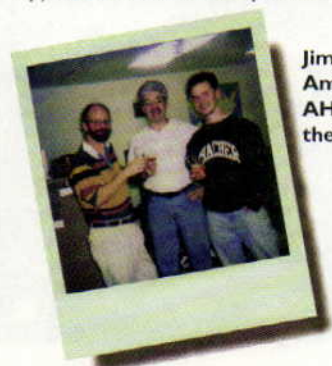
Making great beer doesn't have to be as difficult as putting a man on the moon. You decide how much time and effort you want to spend on your homebrew. And whether you brew an easy-as-1-2-3 pale ale or experiment with a Dark Side of the Moon Stout that you plan to enter in one of our hundreds of sanctioned homebrew competitions nationwide, the American Homebrewers Association® (AHA) is your Ground Control. We're there to help



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## The Guys in the Lab Wouldn't Leave Well Enough Alone

If you haven't taken a close look at AHA in recent months, now is the time. AHA members asked for more benefits, and the guys in our lab delivered. In each issue of *Zymurgy*® magazine — yours **FREE** when you become a member of AHA — we ask for your opinions on each homebrewing article. We also ask you for ideas on how we can do a better job of supporting you in your homebrewing quest. Then we do our best to give you what you want. (The guys in the lab wouldn't have it any other way.) Here's what we came up with...



Jim, Brian and Amahl: our AHA "guys in the lab."

## How to Avoid Alien Encounters

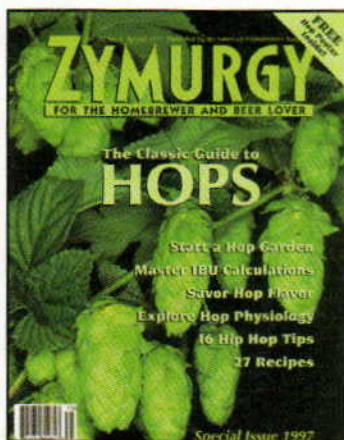


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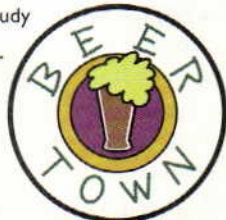
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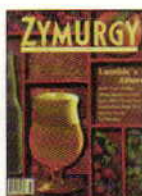
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# Pilot Brewing

Almost all of the pros — from Anheuser-Busch to your local micro — use pilot brews to test new recipes. As a homebrewer, you can, too. There are lots of advantages to pilot brewing that go well beyond mere recipe testing. Pilot brewing can be faster and require less special equipment than brewing five-gallon batches. It can allow you to try out new yeast strains, new hops and malts, spices, herbs, or strange recipes and brewing methods you might not otherwise risk on larger batches. If you like chile beer but no one else around you does, take an afternoon to make a pilot batch for yourself. Don't have the space or equipment to lager beers? Brew a small batch and pop it in the fridge. Planning an important large-batch brew? Do a pilot batch of something experimental a week earlier, and have plenty of healthy, pitchable yeast slurry by big-batch time.

Pilot brewing just might offer you the opportunity to try all those ingredients, potions, and recipes you've been thinking about but haven't had the time for between regular brews. Making small batches is cheap, quick, and so easy it might even get you into trying your first all-grain beer.

## Getting Started

Brewing test batches doesn't require any special equipment except a few stoppers and airlocks. Pilot batches can be done cheaply and effectively in amounts as small as one gallon or as large as three gallons. Your current five-gallon or larger fermenter is adequate, but many homebrew shops carry three-gallon carboys that will make your small-batch brewing much easier. Many markets sell one-gallon glass juice jugs that make ideal fermenters. The tinted one-gallon jugs that hold cheap wine work well and offer some UV protection. Brew up to a two-gallon batch, split it into two one-gallon fermenters, and test two yeasts or two fermentation methods at the same time.

Boiling can be done in your pasta or stock pot, a full mash can be done in a second pot, and a partial mash can be done in a large saucepan.

Pasta colanders and even wire mesh strainers make perfectly effective lauter screens, and a tin watering can makes a good mash rinser.

To illustrate an experimental batch, let's use the following recipe for Stretch-It-To-The-Limit Stout, provided by San Francisco Brewcraft. The beer was given

by Nico Freccia





AMBER ALE

PALE ALE



this name because the amount of dark grains is much higher than most stout recipes call for. The purpose of this small-batch experiment is twofold: 1) to taste the effect of a high proportion of roasted malt and 2) to note the differences that two separate yeast strains will have on the finished beer.

### Stretch-It-To-The-Limit Stout (2 gallons)

#### Ingredients:

##### All-grain:

- 2 lbs. pale two-row malt
- 4 oz. flaked barley
- 4 oz. flaked oats
- 6 oz. roasted barley
- 4 oz. chocolate malt
- 2 oz. black malt

##### Partial mash:

- 1 lb. pale malt extract
- 1 lb. pale two-row malt
- 4 oz. flaked barley
- 4 oz. flaked oats
- 6 oz. roasted barley

- 4 oz. chocolate malt
- 2 oz. black malt

#### Extract with specialty grains:

- 2.25 lbs. pale malt extract
- 6 oz. roasted barley
- 4 oz. chocolate malt
- 2 oz. black malt

#### For all recipes:

- 0.5 oz. Galena or Chinook hops, for 60 min.
- 0.75 oz. Cascade hops, after the boil is finished
- 2 ale yeast strains, for example Wyeast 1084 (Irish style ale) and Wyeast 1056 (American ale)
- 1/3 cup priming sugar

#### Step by Step:

For all-grain batches, mix all grains with 0.75 gal. water in a stockpot and place on a stove, slowly raising the temperature to 150° F. Partial mashers can use a large saucepan or pot to mix grains with 0.5 gal. water and raise to the same

temperature. Extract recipe users should place grains in a mesh bag or just pour them directly into 2.5 gal. water on the stove, and slowly raise the temperature to boiling. Just before boiling, remove the grain bag or, if you're not using a bag, pour wort through a wire strainer into a second pot and bring to a boil.

Mashers should rest at 150° F for 30 to 45 min., then turn on the heat and raise the mash to 168° F. Simply pour the whole mash (carefully) into a colander or wire strainer resting on the lip of your boiling pot. Heat about 2.5 gal. of water to 170° F in a teapot or stockpot, and slowly pour over the grain bed to thoroughly rinse (lauter) the mash. You should collect about 2.5 gal. to add to the pot, and you're ready to boil.

Bring the wort to a boil, remove from heat, and add extracts if needed. Add the Galena or Chinook hops. Boil the wort for one hour. Turn off the heat, add the finishing hops, wrap some plastic or foil tightly around the

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lip of the pot, and cover. Chill by placing the pot in the sink in a bath of cold or iced water, or place in the freezer or fridge for a few hours. After the wort is cooled, pour through a sanitized funnel into two sanitized 1-gal. glass jugs. Pitch a different yeast to each one (don't forget to label them!), fit your airlocks, and relax.

Age for 14 days and bottle using 1/6 cup priming sugar per gallon.

OG = 1.056

IBUs = 65 to 70

### Being Creative and Controlled

Aside from testing new recipes or ingredients, brewing small batches can also be a way to set up controlled experiments that can make you a real specialist in certain areas. The keys are to be creative, take excellent notes so that your experiments are repeatable, and vary only one element each time.

For instance maybe you're seeking a certain hop aroma in your IPA. Try brewing a small batch, splitting it into two fermenters, each with the same

yeast and the same fermentation conditions, and dry hop with the same hops but in different amounts. Or with different hops. Or brew a small batch of standard, basic pale ale in the morning, and brew the same beer using a new type of crystal malt in the afternoon. Brew a wheat beer adding raspberries to the primary in one fermenter and raspberries to the secondary in the other.

If you've never brewed an all-grain batch before, experiment with a small batch using common kitchen utensils such as the stockpot and strainer until you get a general feel for the process, gravities, and techniques.

If you've been dying to make a classic pilsner but don't have the equipment for lagering, try a pilot brew. It's much easier to keep a small fermenter at around 50° F than a large one. Just keep the fermenter in a small bucket of cool water with an occasional ice addition. Lagering is a snap. Rack into a second small fermenter, and pop the secondary in

the fridge for a few weeks.

### Thirst-Quenching Pilot Batch

Here's another great pilot recipe that embodies the spirit of small-batch brewing. The results will really surprise you.

Despite the thought that a watermelon beer might be either sickly sweet or have no flavor at all, yeast really seem to like the stuff. They attack the watermelon meat with a vengeance and leave you with a beer that has a beautiful watermelon nose but a very dry, crisp flavor with just a hint of the fruit. It's a great summer thirst quencher.

### Watermelon Wheat (2.5 gallons)

#### Ingredients:

##### All-grain:

- 1.5 lbs. two-row malt
- 1.5 lbs. white wheat malt
- 4 oz. crystal malt, 20° Lovibond
- 8 oz. honey

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#### Partial mash:

- 1.5 lbs. pale malt extract
- 1.5 lbs. white wheat malt
- 4 oz. crystal malt, 20° Lovibond
- 8 oz. honey

#### Extract with specialty grains:

- 1.5 lbs. pale malt extract
- 1.5 lbs. wheat malt extract
- 4 oz. crystal malt, 20° Lovibond
- 8 oz. honey

#### For all recipes:

- One 8-lb. watermelon
- 0.25 oz. Northern Brewer hops, for 60 min.
- 0.25 oz. German Hallertauer hops, for 30 min.
- Wyeast 1007 (German ale)
- 3/8 cup priming sugar

#### Step by Step:

For this recipe you will be

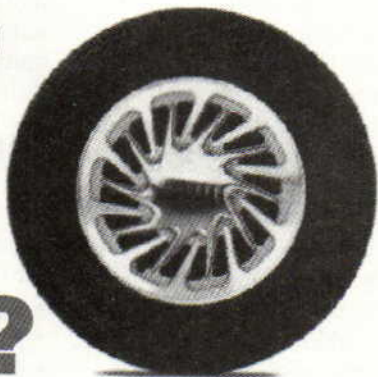
collecting 2.5 gal. of wort to the fermenter. For all-grain brewers, mix all grains with 1 gal. water in a stockpot and place on a stove, slowly raising the temperature to 148° F. Partial mashers can use a large saucepan or pot to mix grains with 0.5 gal. water and raise to the same temperature. Extract-recipe users should place crystal malt in a mesh bag, or just pour directly into 3 gal. water on the stove, and slowly raise the temperature to boiling. Just before boiling, remove the grain bag or, if not using a bag, pour through a wire strainer into a second pot and bring to a boil.

Mashers should rest at 148° F for one hour, then turn on the heat and raise the mash to 168° F. Simply pour the whole mash (carefully) into a colander or wire strainer resting on the lip of your boiling pot. Heat about 3 gal. of water to 170° F in a teapot or stockpot, and slowly pour over the grain bed to thoroughly rinse the mash. You should collect about 3 gal. to the pot, and you're ready to boil.

Add the honey and extracts, if applicable, and the Northern Brewer hops. Boil 30 min. Add the Hallertauer hops and boil 30 min. more. Total boil is one hour. Turn off the heat, wrap some plastic or foil tightly around the lip of the pot, and cover. Chill by placing the pot in the sink in a bath of cold or iced water, or place in the freezer or fridge for a few hours. After the wort is cooled, pour through a sanitized funnel into a sanitized fermenter, pitch the yeast, fit your airlock, and relax.

After primary fermentation is complete, rack the beer to a sanitized 3-gal. fermenter. Cut the watermelon open, cut the meat from the rind, and dice into small cubes. Use a clean knife and cutting board, but don't worry too much about contamination. The watermelon meat is protected inside the rind until cut open, and the acidity and alcohol of the fermented beer is enough to prevent any bacteria from gaining a foothold. Using a sanitized funnel, cram the diced meat into the secondary fermenter. Fit with an airlock and let sit for two weeks. Some meat and seeds will float on the surface, and the rest will sink. Rack to

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OG = 1.054 to 1.056

IBUs = 17 to 19

### Small-Batch Helpful Hints

In general small-batch brewing follows the same rules as brewing of any size regarding sanitation, fermentation temperatures, and so forth. Your one-gallon jug of fermented beer can be siphoned directly into your bottling bucket, and the amount of priming sugar will be the only variable. Remember that five-gallon batches require  $\frac{3}{4}$  cup of priming sugar for normal carbonation. That translates to six ounces per five gallons or 1.2 oz. per gallon. Be sure to weigh the priming sugar accurately for each small batch brew to avoid exploding or undercarbonated bottles. Also, when improvising with one-gallon containers remember that some are not designed for pressure. Do not try to "bottle" the beer in one.

Scaling recipes you like up to

normal batch size or down to small batch size is essentially a matter of multiplication. However, lots of different factors will affect the brew consistency based on the size of the batch. If you are accustomed to brewing concentrated wort with extract and diluting up to five gallons with cold water in the fermenter, and small-batch brewing allows you to boil the entire wort on your stove, hop utilization will be different (more efficient in the full wort boil), color may be slightly different, and other factors such as lag time may be different.

When scaling a recipe up or down, take good notes on your process and the flavor of the beers and make minor corrections based on the differences you note. A two-gallon all-grain mash, for example, can be carried out on your stove. However, when you move the recipe to your five-gallon, camping-cooler mash tun, extract efficiency is bound to be different. Take good readings and adjust based

on your system.

Remember that for a five-gallon batch, you will be collecting about 5.5 gallons to the fermenter. In a three-gallon batch you may only be able to collect 3.75, or for a two-gallon batch, just two gallons. This will dictate how much water you initially collect to the boiling pot, and your gravities will be slightly affected by the different-sized batches. Again, take good notes and gravity readings, stick to the same brewing conditions, and experiment with your system until you have arrived on a simple formula for scaling up or down.

Pilot brewing can be very rewarding with little expenditure of time or money. It is an excellent way to explore brewing by experimenting with new methods and ingredients. And it is an excellent way to make all those strange brews you keep dreaming up without risking all the effort and money you put into the ones you like to come home to every day.

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Ayinger Ur-Weiss

Ayinger Jahrhundert Bier

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Platinum Medal

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# Pucker Up!

## Way Hoppy Beers

**Y**ou're a homebrewer. When you offer non-brewing friends a bottle of your favorite beer — the one you brewed to perfection, that absolute nectar of the gods — do they gasp, grab their throats, and croak, "Wow, that's bitter!?" If so, you are observing a common reaction to the amazing range of flavor and bitterness a homebrewer can achieve with hops. Any true-born hophead will take this as a sure sign of success. The more violent the grimace — the redder the taster's face — the bigger the compliment. We love hops. Pushing the hop envelope does not scare us. Give us 80 IBUs or give us death!

But are we alone in our tastes? We brew beer in many different styles.

Some of those styles, by definition, are very hoppy, with a great deal of hop bitterness, flavor, and aroma. These can be wonderful beers, but the appreciation of them usually has to be acquired through exposure and experience. While people who are used to mainstream commercial American lagers may not appreciate such styles at their first taste, they will usually grow into them in time. Once they do, they will have opened up a whole range of complex and intensely flavorful beer styles that they will be able to enjoy for the rest of their lives.

### The Land Before Hops

The use of hops in brewing is fairly recent, as these things go. Hops

by Sam Wammack







have been regularly used in beer for only a few centuries, while the history of fermented beverages reaches back thousands of years. Considering the four primary ingredients in beer — malt, water, hops, and yeast — hops are the only ingredient of the four not absolutely necessary to making an alcoholic beverage. True, beer wouldn't be pleasant without hops, but the malt would ferment, alcohol would be formed, and something somewhat drinkable would result. Our remote ancestors had to get along with just such hopless brews.

Fortunately, someone somewhere in Europe made an unlikely discovery hundreds of years ago. Why they thought to try such a thing we don't know, but they discovered that the cones of a wild vine in the forest did

amazingly good things when used in the brewing of beer. The cones of the female hop vine (*Humulus lupulus*) fit into beermaking like a hand into a glove. It was found that hops help to preserve beer, as well as coagulating and removing undesirable proteins. They aid in clarifying the beer, they stabilize the flavor, and they are an important factor in good head retention. Most important, the bitterness, flavor, and aromatics of hops balance the cloying sweetness of malt, making beer a flavorful and enjoyable beverage.

The match between hops and beer is made in heaven. While sipping a beer, a homebrewer might ponder what else those medieval people must have tried adding to their brewing process. After all, if they hit on

something as obscure as the cones of that pretty green vine, they must have been trying everything in the forest. The results of the foxglove brew and the nightshade brew were most likely fatal. Those details will never be known, but those early brewers did us all a great favor in finding out that the hop is truly made for brewing!

## Even Hopheads Need Balance

There are a great many hop varieties in many different forms available to modern homebrewers, and the effects and blends of bitterness, flavors, and aromatics that can be achieved by a knowledgeable brewer using them is almost unlimited.

Homebrewers tend to be hopheads. That is, we have been exposed to the intense and complex flavors of

## Guidelines For Hopheads\*

Style	IBU	Just Plain Hoppy	Way Hoppy
Barleywine	50-100	2 oz. Eroica (13.9% AA), for 60 min. 0.5 oz. Northern Brewer (7% AA), for 30 min. 1 oz. Fuggle (4.4% AA), for 5 min.	4 oz. Eroica (13.9% AA), for 60 min. 1 oz. Northern Brewer (7% AA), for 30 min. 2 oz. Fuggle (4.4% AA), for 2 min. 1 oz. Fuggle (4.4% AA), steep 5 min.
English IPA	40-60	2 oz. Challenger (7% AA), for 60 min. 0.5 oz. East Kent Golding (5% AA), for 30 min. 1 oz. East Kent Golding, steep 5 min.	3.5 oz. Challenger (7% AA), for 60 min. 1 oz. East Kent Golding (5% AA), for 30 min. 2 oz. East Kent Golding, steep 5 min. 1 oz. East Kent Golding, dry hop
American Pale Ale	20-40	1 oz. Perle (6.7% AA), for 60 min. 0.5 oz. Cascade (5.5% AA), for 30 min. 1.5 oz. Cascade, steep 5 min.	1.75 oz. Perle (6.7% AA), for 60 min. 0.75 oz. Cascade (5.5% AA), for 30 min. 3.5 oz. Cascade, steep 5 min.
American Brown Ale	25-60	0.5 oz. Chinook (12.5% AA), for 60 min. 0.75 oz. Mt. Hood (5.3% AA), for 30 min. 1 oz. Mt. Hood (5.3% AA), for 5 min.	1 oz. Chinook (12.5% AA), for 60 min. 1.25 oz. Mt. Hood (5.3% AA), for 20 min. 2.75 oz. Mt. Hood (5.3% AA), for 2 min.
Amber Ale	25-45	0.6 oz. Columbus (15% AA), for 60 min. 1 oz. Liberty (5% AA), for 15 min. 0.5 oz. Cascade (5.5% AA), for 5 min. 0.5 oz. Willamette (4.4% AA), for 5 min.	1 oz. Columbus (15% AA), for 60 min. 1 oz. Liberty (5% AA), for 15 min. 1 oz. Cascade (5.5% AA), for 5 min. 1 oz. Willamette (4.4% AA), for 5 min.
Wheat Beer	5-17	0.75 oz. Hallertauer (4% AA), for 60 min. 0.25 oz. Hallertauer (4% AA), for 15 min.	1.5 oz. Hallertauer (4% AA), for 60 min. 1 oz. Tettnanger (5% AA), for 15 min. 1.5 oz. Tettnanger (5% AA), for 2 min.
Bohemian Pilsner	35-45	1.5 oz. Northern Brewer (8% AA), for 60 min. 0.5 oz. Saaz (3% AA), for 15 min. 1 oz. Saaz (3% AA), for 1 min.	2 oz. Northern Brewer (8% AA), for 60 min. 1.5 oz. Saaz (3% AA), for 15 min. 2 oz. Saaz (3% AA), for 1 min. 0.5 oz. Saaz, dry hop

\* Chart assumes the following: five-gallon batch, 2.5-gallon boil volume, 20% utilization



English bitter, special bitter, India pale ale, old ale, California common, American brown ale, imperial stout, and barleywine — and we love 'em! But that is not to say we necessarily want hops at the expense of a balanced brew. These beers have a lot of ingredients, including malt and hops, and the blend of flavors and the balance between maltiness and hoppiness is what makes them great. These beers are not delicate, nor are they hard to brew, but they are complex and they must be crafted in such a way that the flavors complement each other.

The balance you create does not mean that you are wimping out of the hophead club. Sierra Nevada Brewing Co. in Chico, Calif., is known for producing hoppy beers of excellent balance and quality. Just like many homebrewers, the folks at Sierra Nevada are true hopheads, and no one has ever accused them of being stingy with the hops. Still, they achieve an excellent result while using large

amounts. Steve Dresler, the brewmaster at Sierra Nevada, says balance is the key.

It is vital to know what the body of the beer will be (from malt) so it can be balanced by the base bittering hop addition. Then additional bittering, flavoring, and aromatic hop additions are made throughout the boil to achieve the desired result.

Sierra Nevada beers are great examples of the flavors and complexity that can be achieved with high hopping rates. Sierra Nevada Pale Ale has about four or five times the hops of standard American commercial beers (about 37 International Bittering Units), while the Bigfoot Barleywine achieves an amazing 95 IBUs, balanced by a tremendous amount of malt. Favorite hop varieties for the various Sierra Nevada beers are Cascade, Centennial, Chinook, English Kent Goldings, and Mt. Hood. The brewers at Sierra Nevada are traditionalists and brew with whole hops only. Recently, they have been pleased with Magnum

as a base bittering hop, using it to replace Nugget.

## To Boldly Go

Homebrewers go through the same brewing process as commercial breweries, and though the amounts involved are smaller, we can achieve very similar results.

Since hop oils and resins are not very soluble in water, and since the oils and resins contain the bitterness, flavor, and aromatics, a brewer has a lot of control over which hop qualities go into the beer and in what quantities. Bitterness, flavor, and aroma are all extracted by boiling and by



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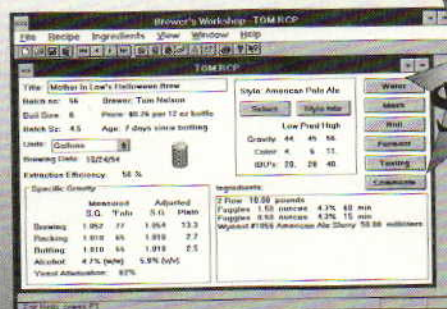
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exposure times. The flavoring and aromatic character is also driven off by long boiling.

Generally, bittering hops should be introduced at the start of the boil and flavoring hops much later in the boil. Since aromatics are lost very quickly to boiling, most homebrewers introduce aroma hops at the very end of the boil. Complexity can be gained in beer by using multiple hop varieties in different additions at different times. The blend of flavors and aromas that results may be much more interesting than simply using one hop variety in the beer.

It is important to remember that when brewing big beers, you are operating with a sledge hammer. The amounts and flavors are big, and in many ways these beers are easier to brew than the more delicate beer styles. A few hop pellets one way or the other would make a big difference in an American light but no difference at all in a barleywine.

On the other hand the large hop additions in these beer styles make large errors possible, and the important thing is balance. A large amount of malt needs a large amount of hops to balance it, but less hops are needed for a smaller amount of malt.

To formulate your recipes and try out different hops and hopping rates, use widely published recipes, charts, and tables as a starting point. When formulating a recipe, it is easy to estimate what your starting gravity will be based upon the amount of malt extract or grain you are using. Once the expected starting gravity is determined, look at published recipes and tables in homebrewing books for beers of the same hoppy style and in the same gravity range to see what hops and amounts they are using. Then, adapt those varieties and amounts to your beer. Stay generally within hop groupings for authenticity: English hop varieties for English styles, German hop varieties for German styles, and so forth.

If you want to keep your beer reasonably tame, keep the total bitterness of the hop bill roughly the same by taking alpha acid percentages and boiling times into account, and

you can't go wrong. The hops will balance the malt in your beer, and the blend of hop flavors and aromatics you have created will be unique.

If you enjoy extreme levels of hop bitterness, flavor, and aromatics in your homebrew, don't be afraid to go for it! Hops are great, it's your beer, and whose enjoyment should you be brewing for anyway, huh?

Published recipes and tables show hopping rates that will please the majority of beer drinkers; they are aimed at the middle of the bell curve of hop appreciation. If you like hops a lot, and if you find yourself far from the center of that bell curve, homebrewing is your way to go. In fact homebrewing is your only way to go because you sure aren't going to find many commercial beers that fit your taste preferences.

In general you can double bittering hop additions near the start of the boil. You can triple flavoring hop additions near the middle of the boil. You can quadruple aroma hop additions at the end of the boil. Boosting the hops in this way will produce beers of intense hoppiness — throat-grabbing, knee-crawling bursts of hop experience, and by golly, some of us will love them!

## Recipes

For each recipe there is a standard hoppy version and two alternatives, very hoppy and way hoppy, that pump up the recipe's Homebrewing Bitterness Units. HBUs are a simple way to keep track of hop bitterness in five gallons of homebrew. HBUs are the ounces of hops used multiplied by the alpha acids in those hops. IBUs take boiling time into account as well.

### Ozarks Special Bitter (5 gallons, extract with specialty grains)

#### Standard Hoppy Recipe 30 IBUs, 20.9 HBUs

##### Ingredients:

- 1 oz. roasted barley
- 0.5 lb. crystal malt, 40° Lovibond
- 3.3 lbs. unhopped amber malt extract syrup
- 3 lbs. unhopped amber dry malt extract
- 0.5 oz. Northern Brewer hop pellets

(8% alpha acid), for 50 min.

- 1 oz. Cascade hop pellets (5.9% alpha acid), for 20 min.
- 2 oz. Kent Goldings hop pellets (5.5% alpha acid), 1 oz. for 10 min., 1 oz. for steeping
- 1/2 tsp. Irish moss
- 2 packs of Doric dry yeast or 1 pack Wyeast 1098 (British Ale)
- 3/4 cup corn sugar for priming

#### Step by Step:

Steep crushed specialty grains in 6 gal. cold water and heat brewpot. Remove grains at 170° F. When brewpot comes to a boil, add extracts and Northern Brewer hops. Boil 30 min. and add Cascade hops. Boil 10 min. more and add 1 oz. Kent Goldings hops and Irish moss. Boil 10 min. more and add 1 oz. Kent Goldings hops and immediately turn off heat and cover pot. Total boil time is 50 min. Let covered pot steep for 10 min. Cool the wort to below 75° F and siphon into the primary fermenter, splashing while siphoning. Pitch yeast.

Ferment at 60° to 70° F until complete, prime, and bottle. Age six weeks before using.

OG = 1.051

FG = 1.012

#### Very Hoppy Recipe 36.1 HBUs (about 50 IBUs)

- Increase first hop addition, Northern Brewer (8% alpha acid), to 1 oz. (8 HBUs, adjust amount according to alpha acid of available hops).

- Increase second hop addition, Cascade (5.9% alpha acid), to 1.5 oz. (8.85 HBUs).

- Increase third hop addition, Kent Goldings (5.5% alpha acid), to 1.5 oz. (8.25 HBUs).

- Increase fourth hop addition, Kent Goldings (5.5% alpha acid), to 2 oz. (11 HBUs).

#### Way Hoppy Recipe 47.3 HBUs, (about 60 IBUs)

- Increase first hop addition, Northern Brewer (8% alpha acid), to 1 oz. (8 HBUs).

- Increase second hop addition, Cascade (5.9% alpha acid), to 2 oz. (11.8 HBUs).

- Increase third hop addition, Kent Goldings (5.5% alpha acid) to 2 oz.



(11 HBUs).

- Increase fourth hop addition Kent Goldings (5.5% alpha acid) to 3 oz. (16.5 HBUs).

### Extremely Imperial Stout (5 gallons, partial mash)

#### Standard Hoppy Recipe 58 IBUs, 24.6 HBUs

##### Ingredients:

- 11.5 lbs. British pale malt
- 1 lb. crystal malt, 90° Lovibond
- 1 lb. chocolate malt
- 1 lb. roasted barley
- 3 lbs. unhoppled light dry malt extract
- 0.5 oz. Chinook hop pellets (12% alpha acid), for 60 min.
- 1.5 oz. Perle hop pellets (7.4% alpha acid), for 30 min.
- 1.5 oz. Willamette hop pellets (5% alpha acid), 1 oz. for 15 min., 0.5 oz. for steeping
- 1/2 tsp. Irish moss
- 2 packs Doric yeast or 1 pack Wyeast 1056 (American Ale)
- 3/4 cup corn sugar for priming

##### Step by Step:

Crush all grains together. Use your favorite mashing technique, infusion, stove-top, or whatever matches your equipment. Strike in at 158° F, cover, and hold for 60 min. Sparge with 175° F water to yield 6 gal. in the brewpot.

Heat in brewpot. When boil starts, add extract and Chinook hops. Boil 30 min. and add Perle hops. Boil 15 min. more and add 1 oz. Willamette hops and Irish moss. Boil 15 min. more. Add 0.5 oz. Willamette hops and turn off heat. Total boil is 60 min. Cool the wort to below 75° F. Siphon into the primary fermenter, splashing while siphoning. Pitch yeast.

Ferment at 60° to 70° F until complete, prime, and bottle. Age six weeks.

OG = 1.087

FG = 1.025

#### Very Hoppy Recipe 36.3 HBUs (about 85 IBUs)

- Increase first hop addition, Chinook (12% alpha acid), to 0.75 oz. (9 HBUs, adjust amount according to alpha acid of available hops).

- Increase second hop addition, Perle (7.4% alpha acid), to 2 oz.

(14.8 HBUs).

- Increase third hop addition, Willamette (5% alpha acid) to 1.5 oz. (7.5 HBUs).

- Increase fourth hop addition, Willamette (5% alpha acid), to 1 oz. (5 HBUs).

#### Way Hoppy Recipe 50.5 HBUs (about 110 IBUs)


- Increase first hop addition,

Chinook (12% alpha acid), to 1 oz. (12 HBUs).


- Increase second hop addition, Perle (7.4% alpha acid), to 2.5 oz. (18.5 HBUs).

- Increase third hop addition, Willamette (5% alpha acid) to 2 oz. (10 HBUs).


- Increase fourth hop addition Willamette (5% alpha acid) to 2 oz. (10 HBUs).



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# 24 Brewing Tips & Rules of Thumb

by John Oliver

The great thing about home-brewing is that in most aspects, there is no one correct way to do it. However, some ways are easier than others, and there is a multitude of tips and tricks that can make the brewing process smoother, easier, and more enjoyable.

## Is My Beer Done Fermenting?

**How to get a wrong gravity reading.** For brewers who lack the equipment to do a full wort boil, many times starting gravity readings are not accurate. Boiling all of the extract

in a smaller volume and then using water to top up to the correct volume in the fermenter will usually not have a severe detrimental effect on the finished brew. But it does make obtaining an accurate starting gravity very difficult. The reason for this is that minor differences in temperature and density between the wort and water make it extremely difficult to obtain a homogenous mixture, even if the fermenter is stirred or shaken vigorously and the color appears even.

If you suspect that your starting gravity reading is either high or low, keep in mind that every pound of



syrup extract in a five-gallon batch will result in a change of approximately 0.007 in gravity.

### **Stronger means longer.**

Remember that as the starting gravity of beer increases, the fermentation and conditioning time will increase as well. Extreme high-gravity beers such as barleywine or doppelbock can take months to reach peak flavor.

### **The three-day test.**

If hydrometer readings three days in a row do not show any further decrease in specific gravity, the beer is usually done fermenting.

### **When in doubt, wait.**

If you are still not sure that your beer is actually done, it never hurts to let a beer sit for a few additional days before bottling.

### **The 25 percent rule.**

When trying to determine if a beer is actually done fermenting, it helps to keep the relationship between starting and final gravity in mind. In this relationship, disregard the 1 in front of the decimal point. For example a beer with a starting gravity of 1.048 would be considered as "048." Multiply this by 25 percent (or divide by four) and the resulting estimated final gravity is "012," or 1.012. This is very handy for helping to estimate final gravity, but actual gravities may vary by a few points up or down due to the use of high percentages of unfermentable specialty grains or adjuncts, or highly fermentable adjuncts such as honey or corn sugar.

### **Specific gravity vs. degrees Plato.**

When making conversions between recipes it is easy to convert between specific gravity and degrees Plato fairly accurately. As above, disregard the 1 in front of the decimal point. To convert between the two, keep in mind that starting gravity is about four times degrees Plato. A recipe that shows starting gravity as 12° P would translate as  $4 \times 12 = 48$ , or 1.048 specific gravity.

**The ice tea test.** When using a two-stage fermentation with primary

and secondary fermenters, try using the following guidelines to determine transfer and bottling times. During the initially vigorous primary fermentation there will be a large cap of foam, called the kraeusen, on the surface of the beer. As the primary fermentation begins to slow, this foam will drop and the surface of the beer will become visible. Any time after this is good to transfer into a secondary fermenter.

After the beer is transferred, it will usually have a murky appearance. Over a period of several days to a couple of weeks, this will begin settling as a fog down to the bottom of the fermenter, with an ever increasing band of clear ice-tea-colored beer above. When the entire fermenter has settled it is time to take a gravity reading, then bottle or keg.

### **The siphon bubble blues.**

During the transfer from primary to secondary fermenters, many times a bubble will form just downstream from the highest point of the siphon, gradually increasing in size until the flow stops and the siphon needs to be restarted. This is caused by carbon dioxide coming out of solution due to the drop in pressure in the siphon.

**When lagering, it is important to allow the fermenter to warm back up to room temperature for a few days prior to bottling**

Preventing the aggravation of a stopped siphon is as easy as quickly pinching shut the flow of beer upstream of the bubble and then releasing. The momentary break in the flow will cause the bubble to flow downstream to the end of the tube. If your siphon tubing is rigid, the same thing can be accomplished by snapping

a finger against the tubing at the sight of the bubble to dislodge it.

## **Yeast Tips**

### **In case of emergency...**

For brewers who have advanced to using true liquid cultures, always keep at least two packets of a quality dry yeast on hand in the refrigerator. It will stay viable for a long time, and in the event of a batch failing to kick into initial fermentation in a timely manner the dry yeast can be used to save what might otherwise end up being a spoiled batch of beer.

### **Warm up to lager.**

When brewing lager beers using true liquid cultures it is important to pitch and allow the beer to begin fermenting at room temperatures (60° to 70° F). Only when the fermentation shows signs of beginning, start cooling the beer to the appropriate lagering temperature. This ensures that the yeast has reproduced to where a strong, healthy fermentation will result at the lower temperatures necessary for lagering, without a long and unhealthy lag time.

Also, it is important to allow the fermenter to warm to room temperature for a few days prior to bottling. This step ensures that not only is the fermentation actually complete, it will help the beer to carbonate and condition in the bottle faster as well.

### **If a little is good, more is better.**

When using dry yeast, use at least two packets for a five-gallon batch. While using one packet will usually work, the addition of more yeast is cheap insurance that will help reduce lag times and reduce the possibility of contaminations.

### **Pitching yeast — into the brewpot!**

Many times imported cans of malt extract will have a nondescript packet of yeast taped to the top of the can, which has probably been stored at room temperature. For each five-gallon batch it is important to use at least two packets of a quality dry yeast that has been stored in the refrigerated section of your local homebrew supply shop. Rather than simply discarding the original yeast, throw it into the



brewpot during the last 10 minutes of the boil. One form of yeast nutrient is the dried hulls of dead yeast. By pitching this yeast into the brewpot, you are effectively killing it and helping to provide necessary nutrients for the yeast that is pitched later at the appropriate time.

### Growing your starters.

The standard half-gallon growler that is available for take-out beers at many brewpubs is the perfect size for making starter cultures of liquid yeast. It has ample room for a good two pints of starter, and most growlers will accept the same size of drilled stopper and airlock as a five-gallon glass fermenter.

### Conversion Formulas

One of the fun aspects of brewing as a hobby is being able to share the products of our efforts with others and to try theirs as well. Many times when brewers gather, it is not uncommon to

overhear them swapping recipes. Here are a couple of good rules of thumb that can be useful when trying to convert another recipe to conform to your own brewing methods or materials.

**Four pounds of dry malt extract (DME) is equal to five pounds of syrup malt extract.** DME and syrup malt

extracts are basically the same product in two different forms. The major difference is that syrup malts contain approximately 20 percent more water by weight than their dry counterparts, which is why they are syrup as opposed to powder. DME has many advantages over syrup malt. It is easy to measure precisely, and in recipes that call for only a portion of a package to be used or for several different malts to be blended, it is easier to store the unused product for use in a later brew. Syrup malts tend to be more readily available and are not as foamy as DME in the boil. Whatever your preference, it is easy

to convert recipes between the two different forms of malt extract by keeping the above relationship in mind. In mathematical terms it appears as:

$$\text{lbs. dry malt extract} = 0.80 \times \text{lbs. malt extract syrup}$$

or

$$\text{lbs. malt extract syrup} = \text{lbs. dry malt extract} / 0.80$$

### All-grain vs. extract.

The conversion between all-grain recipes and malt extract recipes is somewhat less precise due to the possible variations in efficiency between different homebrewers' mashing procedures and equipment. However, a good general starting point for converting all-grain recipes to extract can be formulated as follows:

$$1 \text{ lb. malt extract (syrup)} = 0.75 \text{ lb. base grain malt}$$

Two important factors apply to this

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conversion. When considering the base malt used in the all-grain recipe, remember that you only want to consider the malt that provides the bulk of the fermentable sugars, usually pale malts such as two-row, six-row, wheat, pilsner, or lager. The malt extract that is substituted, whether DME or syrup, should be the lightest available. Specialty grains such as crystal malts, cara-pils, chocolate, or black patent are used primarily for color and flavor as they usually do not make a substantial contribution to the overall level of fermentable sugars in the recipe. These specialty grains can usually be substituted between all-grain and extract recipes on a pound-for-pound basis. Again, individual efficiency rates can vary substantially, but the above formula is great for determining a starting point.

## Recipe and Equipment Tips

**The addition of wheat to a recipe will improve head**

**retention.** To improve the head retention of a beer, the addition of 3 percent to 5 percent wheat (either extract or grain) will do the job without adversely affecting the flavor of the final product.

**Mr. Oakey.** Adding oak to a beer to get an authentic "cask-conditioned" flavor is not difficult. Using a regular coffee filter, load up the basket of your home coffeemaker with oak chips, and then run a cycle. The resulting oak tea is sanitized by the heat, and a precise amount can be added to the finished beer to get the exact level of flavor desired.

## Dishwasher sanitizing.

The heated rinse cycle of a home dishwasher is great for sanitizing bottles, but keep two things in mind. First, the bottles still need to be clean prior to being placed in the dishwasher; any deposits inside the bottles will not be removed by the water spray. Second, be sure to run at least one cycle of

water only (no soap) in the dishwasher prior to placing your bottles in. The standard detergents used in dishwashing contain chemicals called surfactants that break down the surface tension of water, causing the water to "sheet" on the surface of the dishes and prevent spotting. These compounds are very tenacious (they are not designed to be rinsed away!) and the tiniest amount that ends up in your otherwise clean bottles will destroy the head retention of any beer that is put in them.

**I can see clearly now.** The addition of Irish moss in the last 10 to 15 minutes of the boil at the rate of one-half teaspoon per five gallons will help to ensure the clarity of the finished beer by helping proteins to precipitate. The great thing about Irish moss is that it is relatively benign; it settles out during fermentation and will not impart any off-flavors to the finished product.

**Siphon into the fermenter from the brewpot.** After chilling,

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allow the cooled wort to settle in a covered brewpot for five to 10 minutes. Then siphon into the fermenter, holding the intake of the siphon tubing just under the surface of the cooled wort, following it down as the brewpot empties. When you reach the thick layer of protein and hop trub in the bottom of the brewpot, stop the siphon. The result will be a cleaner, clearer finished beer.

**Soot solution.** High-output propane cookers are really great for speeding up the boil on a batch of brew, but economy models without good gas and air controls can leave the outside of the brewpot coated with a heavy layer of black soot. Before the brew session, use liquid dishwashing soap and coat the entire lower surface of the pot. After the brew session simply rinse. Most of the soot will rinse right off, making cleanup a breeze.

**Easy does it.** If you're using a kettle that has a probe-style thermometer mounted into the side of the kettle for mashing, use restraint when turning up the controls of the cooker. High-output varieties of 150,000 BTU or more can send out a blast of heat and flame that will curl around the bottom of the kettle and up the sides, quickly incinerating the thermometer.

**Keeping in the dark.** A lot of importance is attached to using brown glass bottles in lieu of green or clear to prevent finished beer from becoming light struck. However, very little attention is given while the beer is in the fermenter prior to bottling, yet the same off-flavors can result. If you use clear glass carboys, they can usually be protected from direct light by inverting a standard grocery sack over the fermenter with a hole cut out to allow the neck and the airlock to protrude.

**No-cost temperature controls.** For brewers living in the Southern states, high summer temperatures can mean difficulty in maintaining good fermentation temperatures. However, such a situation does not necessarily mean

purchasing an extra refrigerator for brewing or running the household air-conditioning full blast 24 hours a day. By taking a large towel soaked with cool water and wrapping it around the fermenter every morning, you can keep the ferment as much as 10 degrees cooler than the surrounding temperatures through evaporative cooling.

Remember, in brewing there is no one single right way to do everything. Many of these tips and tricks are things that brewers learn while sharing a brewing experience or a homebrew with other brewers over the years. Sharing information can be just as much fun as sharing the finished product, so don't be afraid to try something different or new! 

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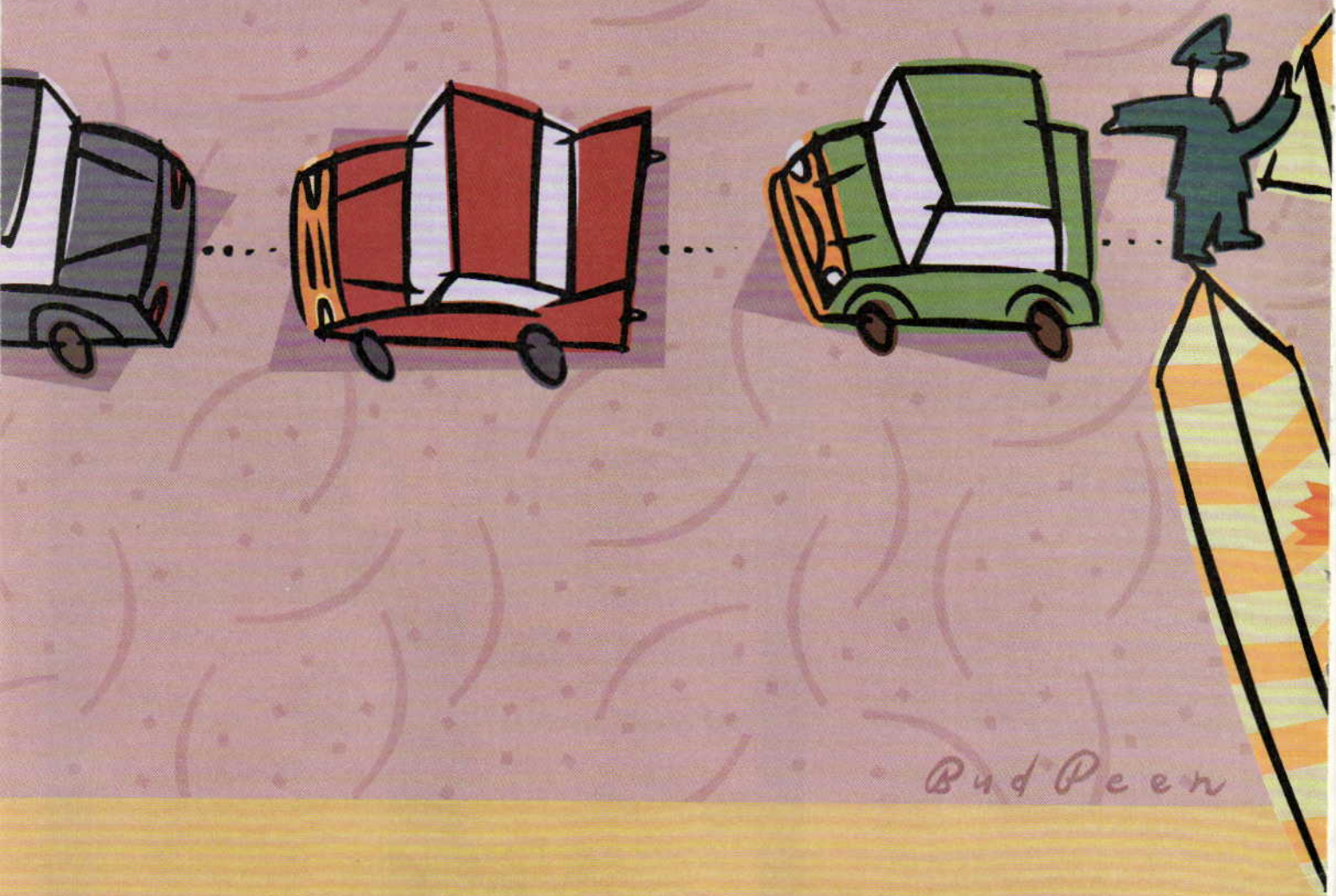
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*Bud Peen*

# A Practical Guide

by Randy Whisler

Considering how important it is to the brewing process, lautering doesn't get much respect. Many brewers see it as simply the process of rinsing grains. They give it little thought, rush through it, and curse it when it causes problems





# to Lautering

such as a stuck lauter.

But a successful lauter plays an important role in getting the most from your grains, avoiding astringent flavors, and making your brewing more consistent.

Lautering, by definition, is simply the separation of mash solids from mash liquids. The act of lautering gives the brewer the wort needed for making beer.

Lautering begins after the mash.

Mashing means that grains are immersed into water warm enough (149° to 158° F) to convert starch into small sugars, among other processes that take place. Most of these particles that are broken down into smaller



parts become soluble (they become a liquid solution). These small parts are required by the yeast to convert wort to beer. However, the yeast doesn't really need all the solid stuff, and not even the most hearty homebrewers want that much body to their beer. Plus if you boiled the gruel at this point, you would end up with excessive tannins in your beer. Therefore, lautering was invented.

The basic principles of lautering involve putting the mashed grain into a vessel with a sieved bottom. Using the most standard setup, you will mash and lauter in the same (sieved-bottom) vessel. The sieve can be anything from a leg out of a pair of nylons (usually large and preferably never before worn) to a V-plate stainless steel false bottom installed in one of those large, round water coolers. The sieved vessel then allows the liquids of the mash to flow out of the mash tun into another vessel.

However, there is a small problem here. This initial juice that escapes

from the lauter vessel has a very high initial gravity, which is not always preferred by the brewer, and a brewer who just drained the lauter without adding more water would lose a bunch of sugar that the yeast could otherwise eat. So unless you want really small batches of high-alcohol beer, you have to add more water back into the lauter.

### The Process

The details of the lautering process depend to some extent on the equipment you use and the type of beer you are brewing. For this example we'll look at a beer of medium starting gravity, lautered in the most standard of homebrew lauters, the five-gallon bucket with umpteen zillion holes drilled into the bottom of it, stuffed into another five-gallon bucket with a spigot near the bottom.

At the point when you are just completing your mash and are ready to lauter, the mash water will serve as foundation water. Foundation water allows the mash to float rather than

become wedged into the sieve. If you were lautering in a separate vessel, you would fill the bottom with 175° F water and add the mash.

Hot water is preferred to cold water for lautering. Hot water extracts more sugar than cold water. There are many chemical/physical principles at work here, but they can all be boiled down into a maple-syrup example. If you have ever tried to pour maple syrup straight from the refrigerator onto your waffles, you know the syrup does not pour very fast. But if it is heated, it pours much more quickly.

The same is true for the sugars in the mash. If you add cold water to them, they will move very slowly through the lauter. But if you add hot water, the sugar molecules move around much faster and are therefore extracted much faster. Another reason for using hot water is that you will be able to bring the wort to a boil faster once lautering is completed.

Once the mash is complete, let it

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settle for about five minutes. This allows the grain bed to sort of settle out. At the end of the five minutes, open the spigot and start running off slowly. The lautering process should take about an hour; it's not a race. A common mistake made in lautering is to zip the water through the lauter and into the boil as fast as possible.

At the start of the lautering process, you should use a quart container to catch the first runnings. These will be cloudy and have bits of husk in them. Pour the cloudy, husky material back into the top of the lauter. This process is called *vorlauf*, a German word that means temporary. The mash materials will act like a filter and clear the runnings.

Repeat this process until you are satisfied with the clarity of your wort. Some worts never become totally clear, while others can become almost crystal clear. It depends on your lauter tun design and the type of malt and adjuncts you are using. However, as a general rule you should at least *vorlauf* long enough to get the husky material out of the runoff. Fifteen minutes is a reasonable time for the *vorlauf*.

Once you have reached the desired clarity, you can start running off into the brew kettle. Again, this is not a race. You should take at least 45 minutes to run the rest of the water through the lauter vessel. You will notice that the water level in the lauter tun will begin to get low as you drain off the bottom liquid.

At this point you should be adding hot water back into the top of the lauter. One of the simplest methods is to put boiling or near-boiling water into your quart *vorlauf* jug and add the water as needed to the lauter vessel. It is a good idea to keep the water level in the lauter about an inch above the grain bed.

This is one simple method for adding water to the lauter tun. There are many tools available to help the brewer add water evenly over the top of the lauter bed. Some are as complicated as another bucket attached to a tube that runs into a second, T-shaped tube. When water is added to the bucket, the T-tube spins around like a lawn sprinkler. For the most part these devices work well.

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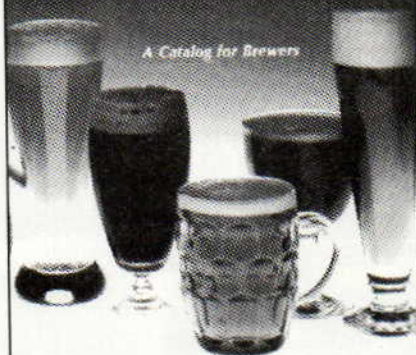
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You can also use an ordinary gardening water can, plastic not galvanized. If you use this method, the water will cool down significantly between the time it's on the stove and it gets to the lauter, so overshoot your target temperature a bit.

The important thing is to evenly distribute the water over the top of the lauter. This allows the water to flow evenly through the grain bed. The whole purpose of adding the extra water is to extract more sugar. Therefore, it makes sense to evenly distribute the water. If the water does not get to a certain spot in the lauter bed, you will get what are called sweet spots. Sweet spots represent lost extract.

One way to prevent sweet spots is to stir up the top of the grain bed with a fork. You can go as far as halfway down the bed and not disturb it too much. But it's important to move gently. Some people might be afraid that this will disturb the bed too much. If you feel that way, this is by no

means a necessary procedure. It just helps you get the most out of your extraction. Also, only do this early, during the vorlauf. Doing it later may cause setting of the disturbed layers, leaving you with a stuck lauter.

### Finishing Up

So when do you stop lautering? You have been adding water for quite some time now. How can you tell when it is time to stop? There are two schools of thought on when to stop: when you reach a certain volume or when you reach a certain gravity. Of course if all goes well, you'd like to hit both at the same time. However, this takes a lot of practice.


If you decide to aim for volume, the question becomes: Which volume is correct? This depends on how much energy you can stuff into your boiling kettle. If you are using a five-gallon fermenter, you need 5.5 to eight gallons of starting wort. Generally if you are boiling on a stove top, you won't need much more than 5.5

gallons. That's because the boil on most stoves is fairly weak. However, if you're cooking on a propane burner, especially one of those 150,000-BTU flame throwers, and you have a large enough kettle to contain the boil, you can easily extract eight gallons of wort and boil it down to five in an hour. You will also get good hop extraction this way.

If you decide to aim for a specific gravity, you won't know in advance, especially when you first try this, how much volume you'll end up with. With time, as you get more used to your system, you may become successful at predicting the volume.


However, aiming for specific gravity will make your results more consistent with the recipe, if you're using one. It will also make it easier to repeat your results the next time you brew the same beer.

The specific gravity method entails taking periodic gravity readings in the boiling kettle. The general method for this is to take a sample of wort, put it



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in the measuring device, and immerse the measuring device in ice or ice water until the temperature is correct. Then, take a gravity reading and throw the wort back into the boiling kettle. Continue to take gravity readings until you have reached the desired gravity. Keep in mind that the gravity after boiling will be higher than the gravity at the start of the boil. This is due to evaporation of water during the boil.

As the measuring device, it's helpful to use a copper tube with one closed end. Copper has a tremendous heat-exchange capacity, which allows the wort inside it to cool much more rapidly than wort cools in plastic. Also, stirring helps greatly. Convective heat exchange, heat passed by a current or flow, is much faster than conductive heat exchange, the passive process of giving off heat without the aid of a current.

There is also a third method that is used to decide when to quit lautering. It involves neither volume nor gravity of the extracted wort. This one is practiced by those fearful of tannin being in their beer. This method involves either tasting or taking a gravity reading of the wort as it exits the lauter tun. It is generally accepted that when the readings get down to a specific gravity of 1.008, there are more tannins and other unwanted material flowing from the lauter vessel.

If you are tasting the wort, at the point when you can no longer perceive a sweet flavor the gravity ranges from 1.012 to 1.006, depending on your ability to perceive sweetness. If you fear tannin, stop the lauter at this point.

If you still need more water to reach the volume you desire, then you can make up that amount of water by using hot tap water, or take the excess sparge water and pour it directly into the brew kettle. The important point is that you are not losing too much fermentable sugar at this point. It is completely acceptable to use this practice. Many professional brewers use this method.

## Nothing But Time

What if the lauter is taking too long? First, it's important to emphasize that a lauter that goes too fast is a more common problem than one that goes



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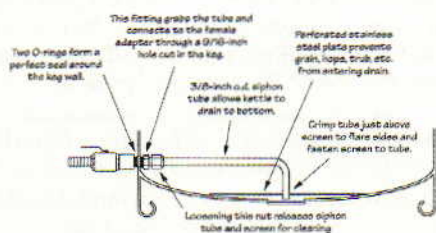
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to slow. If you lauter for 15 minutes, you're going to leave a lot of sugar behind, and your extraction efficiency will be closer to 50 percent than 60 or 70 percent.

The two most likely reasons for a slow lauter are:

1. The grain was milled too small.
2. The protein layer that forms on top of the grain bed has set thick and is restricting the flow of wort through

the grain bed, thus leaving Lake Lauter in its flood stage.

Both of these problems are easily rectified. If your milling size is too small, simply make it larger. Many people try a small milling size because they are dissatisfied with their yield and want to get more extract out of their grain. But a larger mill setting (the actual setting varies based on the type of mill and grain) combined with

a slow lauter will result in substantial extraction.

The second problem of the protein layer on top of the lauter is easily remedied by taking a fork and periodically stirring the top of the grain bed. A side note on this problem: Wheat is notorious for gumming up lauters, so expect some delays in lautering a wheat mash. Also, grind the grain a bit larger than normal for wheat beers.

There is yet one more way that you can slow your lauter down, and that is by sticking your lauter bed. This basically means that the wort is removed too fast from the bottom of the lauter, causing the top of the lauter bed to push down on the sieve. This stops all flow through the lauter.

The most common way that this happens is that people take a long tube from their lauter spigot and put it into their brew kettle on the floor. Then they open the lauter spigot. The wort in the tube creates a great suction and, whammo, a stuck bed is formed.

To get rid of a stuck bed, underlet the lauter by pushing water back up through the spigot. This helps clear the sieve holes. After underletting you should wait about five minutes, then resume lautering.

Here's one last suggestion to make the lautering process easier. As soon as you are done using your lauter tun, clean it. Procrastination about cleaning the lauter tun will almost inevitably cost you more time next time you brew. Also, there tends to be a fascinating array of molds that are willing to spring up in as little time as a day or two if the lauter tun is left even partially dirty.

Finally, if you still have trouble going slowly through the lautering process, try drinking some of your previous work during this time and making it a social event. Most all social events are known to cause time to elongate. ☺

*Randy Whisler is a brewer and microbiologist at Smuttynose Brewing Co., Portsmouth, N.H. He holds an M.S. in brewing from the University of California, Davis.*

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# Designing Great Labels

by Keith T. Yager

*Get ready for BYO's Gonzo Label Contest! Creating and using artistic labels is easy and quick. And they can help your brew make a big impact.*

"You've got to try my new brown ale," my good friend says to me. I know it's a brown ale because he has scribbled "BA" on the bottle cap with a green marker. Later that evening I open the ambiguous, little brown bottle and pour myself a glass of rich, foaming ale. Good beer. But from the very moment the bottle crossed my field of vision, something was missing. That something is known as "the first impression."

Picture this: You finally introduce your batch of two-year-old barleywine to a good friend and beer connoisseur.

You pull two bottles from the fridge and present them. Two identical labels, splashed with color, announcing proudly the name of the beer in big, bold letters. Smaller print boasts of the ingredients blended together to form your masterful creation. The label also speaks of a date, some two years earlier, when the beer was locked away from the world like a little time capsule. Very impressive! Before that first wisp of vapor is encountered, before that bittersweet bite of malt hits the tongue, before the warmth of the alcohol comforts the soul — the beer is experienced!

It's not difficult to create stunning labels that will enhance the ambiance of your beer. What is perhaps more important, affixing and removing labels, can be the easiest part of labeling. Forget those 48-hour soakings to remove those stubborn, self-adhesive labels. In fact with the right technique, labeling can be as easy as "press and peel." Press it on before it goes into the refrigerator. Peel it off when the bottle is emptied.

Any serious homebrewer knows that labeling is a necessary project — especially if they brew more than one batch at a time. Your American pale ale and Czech-style pilsner look strikingly similar side by side in the cold, pale light of the refrigerator. We need labels. Labels discern one batch from another. Dated labels remind us how fresh our beer is. Perhaps, most important, they give our beer a name and a face.

## Designing Labels

Almost every label I've ever seen on a bottle of homebrew has been nothing more than plain type printed on self-adhesive paper run through a





laser printer. In addition to the fact that these labels are hard to remove, they also have several other drawbacks. Sometimes the labels will peel from the backing as they travel through the printer and wrap



themselves around a roller. The type can also be difficult to align in the constrained space allotted by the paper manufacturer. And because the space is constrained, your design often becomes cramped.

I use plain laser paper for all my labels. Not only is the shape of my label left up to me, but laser paper is a heck of a lot cheaper than adhesive paper. Don't worry about attaching the labels; that's the easy part.

Begin by playing with a few typefaces until you find one that "looks" like your beer. Try different sizes and different effects. Most drawing programs on PC and Macintosh computers have several built-in effects that can augment type with the click of a mouse. Finding a good typeface should be relatively easy, but suppose you want some art?

The Internet is a great place to find art. In fact there are so many downloadable images on the Internet that finding art should never be a problem. For my "New Harvest Moon Autumn

Brew" (page 51) I found an actual photograph of a moon on a science Web site. I set the moon on a black sky, ran some white type across the side of my image area, labeled the ingredients, and had an impressive label in about five minutes.

Computer scanners are great for the addition of art. You can add your personal photographs to any label with a scanner and your design potential becomes limitless. If you don't have access to a scanner at home or work, bring your photograph and a floppy disk down to a quicky printer and have them scan it for you. Have the image scanned at as high a resolution as possible. If the image resolution is saved too low, the art will be pixilated and the quality poor. On the other hand a high-resolution image will not fit on your floppy disk and could cause nightmares during printing. A resolution of about 100 to 150 dots per inch (dpi) should be adequate for label design.

I presented a bottle of mead to my sister on her first wedding anniversary.

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On the label was a full-color picture of her and her husband on their wedding day. I don't have a color printer, so I took the image to a photocopy center and let them output it for a few bucks. My sister loves the bottle so much she still hasn't tasted the mead!

You don't need a high-quality color printer to create colorful labels. Plain laser printers are ideal for adding spot color to your labels. For my "Winterfest Celebration Ale" I created a nighttime winter scene on a reversed label (page 52). Because the type was surrounded by black, I was able to add color with a yellow-gold marker in a matter of seconds without worrying about going out of the lines. I added green to the pine trees and left the stars and the snow white against the black of night. It only took 15 minutes to add color to 40 labels. As my family and friends celebrated Christmas eve, the beer went down smoothly and the celebration was fine.

With a good laser printer, a drawing program, and a couple of



cool typefaces, you've got yourself a miniature label production center. You can crank out beautiful labels to give your beer a special touch. Your friends are going to be even more impressed!

### Printing, Affixing, and Removing

Now for the easy part.

You should duplicate as many labels as possible in the image area of the paper size you plan to print. Arrange your labels so that one knife or scissors slice will separate them from each other. But don't cut them just yet!

The easiest and most accessible

way to affix labels is to invest \$1.50 in a glue stick. I use a glue stick with a clear adhesive that is applied through a roller located at the tip of the implement. I suggest that you find a glue stick with a liquid or gelatinous adhesive, because they seem to glide easier. But the "lipstick"-type glues work well enough, if that's all you have. The glue I have found to work the best is manufactured by Pentel.

Turn a table into your work station while taking the proper safety precautions, such as protecting your surfaces with newspaper. Then apply one streak of glue down both sides of your

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paper and one down the middle so that one small streak of glue has been applied to each side of the labels. Don't use too much glue. One thin streak will be more than enough to affix your labels to their prospective bottles.

Cut the labels out and tack them onto your bottles. If you find your labels dry too quickly, an easy solution is to cut the labels out before adding the adhesive. Then just dab a little

glue on each corner and press the labels to the bottle.

The labels will stay on your bottle until the day you decide to peel them off. Because you've only used a touch of glue, they will peel off easily.

### A Few More Suggestions...

Always put the date the beer was bottled on your label. Labels should be pragmatic as well as aesthetic. If

you've lagered a doppelbock for six months, declare that on your label. Use your labels to brag about your beer.

If you don't have adequate drawing software, there are plenty of shareware trial versions on the Internet. Also, there are trial versions of photo-lab software that can be used to tone and enhance your photographs or tonal artwork. These trial versions usually last for 30 days before you are expected to buy them.

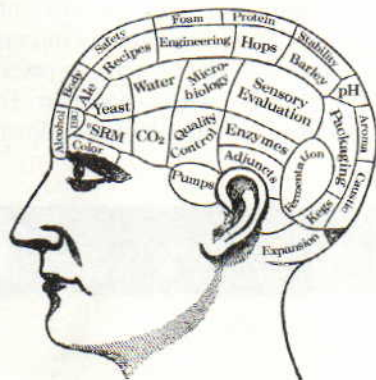
If you're having trouble finding that special piece of art, call up your favorite search engine and run a find on "clip art." There are literally thousands of clip-art sites on the Internet. Much of this art is designed for graphics professionals, but homebrewers are not excluded.

You can hand draw your labels if you don't have a computer. The labels should be drawn large and then reduced to the appropriate size with the help of a copy machine. Just make sure you use black marker for the design, as graphite does not reproduce well. Reproduce as many copies as you need and save your original for next time. You can use all of the techniques described to attach and remove your labels.

And finally, have fun. That's what brewing beer is about anyway. If you don't enjoy art or you're just not good at it, then ask an artistic friend to design something for you. Artists are usually flattered by such requests, especially if there is beer involved. ■



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CIRCLE 56 ON READER SERVICE CARD



# Making a Prison Break

by Stan Hieronymus and  
Daria Labinsky

When Vino's Brewpub began brewing in 1993, the fact that some of the equipment came from a prison auction made for a great story. But it didn't always make for good beer.

"Our quality control was miserable," says operating partner Henry Lee.

The Little Rock, Ark., brewpub installed a "real" brewhouse at the end of 1995, so Lee isn't shy when he talks about those first beers. "About a four," he says, when asked to rate them on a scale of one to 10. James Robertson wasn't even that kind in his *Beer Taster's Log* (Storey Publishing). He gave Big House Brown Ale a 29 (out of 100), Seventh Street Pale Ale a 27, and Lazy Boy Stout a 24.

Lee must have felt somewhat better after Michael Jackson tasted the beers in the fall of 1996 and gave Rainbow Wheat, a hefe-weizen, three stars (out

of four). Jackson wrote the ESB was "yeasty, quite bitter, and tasty," and the Rainbow Wheat "toffeeish and fruity (bananas, lemon?)."

"We're still in a new market here for specialty beers," Lee says. "We're typically five to 10 years behind the rest of the nation." That hasn't stopped him from pushing Arkansas' beer envelope, however. From the time the bar opened in 1989 until 1997 it had the most tap handles in the state. But when the Bennigan's restaurant chain began its Copper Clover beer tour program, an outlet in Little Rock passed the brewpub. Vino's still offers 11 guest beers from 16 handles and was the first place in the state to serve Guinness and Bass on tap.

Nonetheless, the house beers are newcomer friendly. The Six Bridges Cream Ale and Firehouse Pale Ale both have fewer than 20 IBUs, but neither is a simple beer. The pale ale is made with a combination of six malts and two hops. Lazy Boy Stout, the other regular, has seven malts and three hops. It starts at 1.054 original gravity and has 25 IBUs. Both chocolate malt and roasted barley are evident. All are made with the house yeast strain, Wyeast 1056.

"We're developing a following of hopheads, so we've usually got to keep something on for them," Lee says. He has given brewer Dave Raymond, who came from Bosque Brewing Co. in Waco, Texas, in the fall, free reign on creating specials. The first was an alt beer, the second a Scottish ale, and the third a Belgian strong ale.

"I can be a little bit of an artist here," Raymond says. "It's more fun. You can walk out into the brewery and watch everyone enjoying your stuff." His Scottish ale had five malts: 75 percent two-row, 10 percent Scottish, 5 percent crystal, 4 percent roasted, and 6 percent peated (a medium peat). He used Kent Goldings for bittering and flavoring



Brewer Dave Raymond has introduced Vino's Brewpub patrons to alt and Belgian styles in addition to milder house beers.





and added nothing for aroma. The beer had an OG of 1.052 and 18 IBUs.

The alt was the first beer Raymond ever made commercially from one of his own recipes, and he was justifiably proud of it. It was made with five malts, and the three-barrel batch had 15 ounces of Tettnanger for bittering, nine ounces of Hallertauer for flavoring, and 12 ounces of Saaz in the whirlpool. These are recipes a homebrewer can relate to, in part because the system is still relatively small.

Lee says cost was a big factor when it came to selecting a brewing system, and he and his partners chose a three-barrel system from DME. "We didn't feel we were going to be a place that needed a seven-barrel system," he says. Space was also a consideration. Vino's uses pre-crushed grains, because there is no room for a mill.

Lee began to think about enlarging the brewery a year before he did. "It was toward the end of '94," he says. "We'd been a year and a half struggling through..."

Before Vino's got the current system, the beer was brewed above the restaurant in a 30-gallon, jacketed steam kettle acquired in a prison auction and fermented in 50-gallon plastic trash cans. The mash tun was a converted 120-quart ice chest. Initially, exhaust from the kitchen went straight into the brewery. "Pizza yeast didn't go well with beer yeast," Lee says. "It consumed two batches of beer."

The brewery had no temperature control. In the summer it would be 85° F upstairs. "Beer would ferment out in a day," Lee says, unable to keep from chuckling at the memory. "In the winter it was so cold, we had to put heating blankets around the beer."

That didn't stop the customers, though. "We couldn't keep up, even with not very good beer," Lee says. "Diacetyl was a big problem. We'd never know from one batch to the next what we'd get. It was driving us all crazy." Lee spent a lot of time on the phone asking for advice. "The thing I've loved about this business is

everybody is willing to talk to you," he says.

He talked often with Chuck Skypeck, then at Bosco's Pizza Kitchen & Brewery in suburban Memphis and now vice-president and head brewer at the Nashville Bosco's. Skypeck is also a DME sales representative. By the time Lee attended the 1995 National Craft-Brewers Conference in Austin, Texas, he and his partners had purchased the building next door. "Austin sold me; I knew we had to do it," Lee says.

The assistance he received from Skypeck helped cement the deal. "That, and the fact it was a turnkey system. At the time I didn't have a brewer," Lee says. Lee hired Michael Scheimann, who worked in Colorado before arriving in Little Rock. Scheimann formulated some recipes and reformulated others before he returned to Colorado to take a job at Tabernash Brewing Co. in Denver.

Vino's originally installed four three-barrel fermenters, then added a seven-barrel fermenter (for the pale

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ale, which is the best-selling beer by far). The brewery is on display in a window that faces the street, in a non-smoking dining area beside the main dining room.

Sales of beer brewed at Vino's were up 38 percent for the first year with the new equipment. "We had good beer, and people could see what we were doing," Lee says. "We didn't have any fanfare, but as soon as customers tasted the beer, they knew the difference."

Customers frequent Vino's for a variety of reasons. They come for pizza and calzones that would make any big-city Italian restaurant proud, and at least four nights a week there's live music in the back room. Lee, a former construction engineer who built offshore oil platforms, opened the restaurant with two partners, Alan Vennes and Bill Parodi, in 1989. The name came from one of Vennes' nicknames, Lee said; they wanted

something that sounded Italian.

"We're a little too laid-back, a little too weird for a lot of people," Lee says. "We get the tattooed and pierced crowd, and a lot of artists. But you come in here at happy hour and you'll find people in coats and ties sitting at the bar." Although the partners were told they were crazy to open in the downtown area, employees from surrounding businesses line up at the front counter to order lunch.

Vino's decor is simple. Some of the flooring is original to the 1909-to-1910-era building, as is the pressed-tin ceiling. Tall shelves are lined with old beer cans donated by local can collectors. Graffiti covers the bathroom walls. The most recent expansion was the addition of a wooden deck out back last summer. The deck is a beer garden complete with picnic tables, a colorful folk mural, and hanging lights.

The all-ages music club emphasizes

alternative rock and folk music, including Celtic. Green Day and Better Than Ezra played there before they became famous, and the local folk club hosts regular gatherings. The music room has band posters and neon lights in various shapes on the walls, as well as a pinball machine. The room seats about 90, and 150 or more can fill it on a Friday night.

The atmosphere is non-corporate by design. "We kind of pride ourselves on that," Lee says.

Particularly when they can serve up good beer along with a good story.

Vino's Brewpub is at 923 W. Chester St., Little Rock, Ark. Call (501) 375-8466. Send e-mail to: [vinosbrewpub.com](mailto:vinosbrewpub.com). ■

*Stan Hieronymus and Daria Labinsky are authors of the Beer Travelers Guide, which lists more than 1,700 brewpubs, bars, and restaurants in the United States that serve flavorful beer.*

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# Another Fine Mess

by Doug Funk

I have three books that describe themselves as "complete and comprehensive" guides to homebrewing, but they're not.

I've read them all, every word, and nowhere do they detail one of the most important parts of the homebrewing process. Once the brewing or bottling is done, there's one critical step that remains: mopping the kitchen floor.

Maybe it's just me. Maybe I'm sloppier than other homebrewers. I think my wife would agree with that description.

"Slow down," she has been known to say. "You don't have to do this at 90 miles an hour."

In the beginning she was a participant, although not a willing one. She had little interest in beer or brewing. I see now that she simply wanted her kitchen intact when it was over.

I knew early on that brewing and I were meant for each other. It's a messy process and I'm a messy guy. There are pots full of sweet, sticky fluids that have to be boiled, cooled, and transferred. It takes an armload of hoses and tubes to get things done, and the hoses all relish the chance to come unhooked and spray liquid across the kitchen.

One of my hoses fastens directly to the faucet in the sink. I use that one for cold water, and I know from experience that you can't hold your thumb over the end of it to stop the flow as you move it from one container to another. It simply blows the fitting loose at the faucet and creates a minor explosion of water in the process.

But I don't have time to turn it off. If you move it quickly, you really don't waste a lot of water.

I go to great lengths to avoid breaking the flow once I have a siphon started. It's easier to spill a little

sugary liquid than to start again. Add in the possibility of contamination while you're sucking on the end of the hose, and there's no question.

Then there's the blow-off during the early stages of a rambunctious fermentation. Several times the blow-off hose has worked its way out of the water jug and happily pumped fermenting fluid under the freezer, which sits nearby.

Once I started a batch of



*This lesson wasn't covered in any of the brewing books.*

lager outside the refrigerator, planning to gradually decrease the temperature over several days. Sometime during the first night in the fridge a plug apparently formed over the blow-off tube. The pressure increased until it blew the rubber stopper and about half the beer out of the carboy. I don't know if other refrigerators are water-tight, but my brewing refrigerator is not.

I thought it was funny until my wife explained that I was, at that moment, on the way to the local hardware store to rent a carpet cleaner. She even made me buy the special cleaning solution out of the beer budget, which was already in the red — about the color of my face, come to think of it.

Once the fermentation is complete, you have to guide the beer into bottles and it can be reluctant. I bought a little tube with a valve on the end so that when a bottle is full, you simply lift it and the flow stops. But you have to be there to lift it. If you're looking the other way, bottles fill in an eye blink and sticky beer spreads itself across the floor.

A layer of sugar on the bottom of my shoes reminds me of Velcro. Each time I lift my foot it rips the sole of my shoe away from the floor and there is no chance I can lie when my wife, who is needlepointing in the living room, poses her question: "Floor a little sticky?"

When my brewing career began I never expected to learn so much about kitchen maintenance. I have learned, for example, that hot water alone can make the floor look clean and still leave a layer of sugar thick enough to glue your shoes to the floor. "You need to use a little soap," my wife explained as she summoned me back to the kitchen and pointed me toward the mop.

The beer recipes I read end with instructions on bottling. "Bottle with three-quarters cup of corn sugar," they say, or perhaps, "Age two weeks before sampling." All of my recipes need to end with the following statement: "Mop the kitchen floor." ■

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