BrewYour Own

January 1997, Vol.3, No.1
Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

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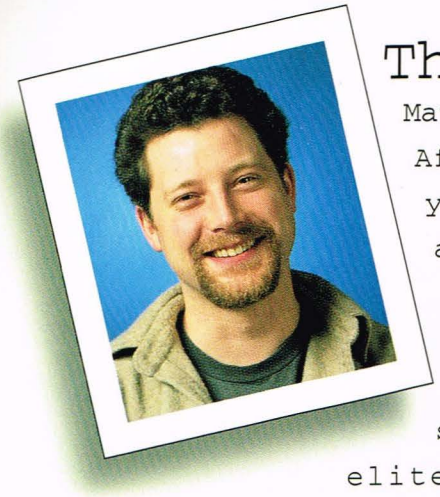
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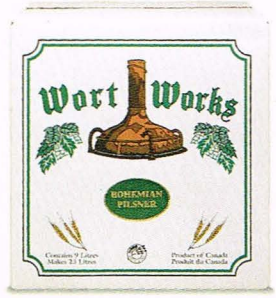
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This is Sean. He's our beer guy.

Matter of fact, around Brew King, we call him "The Beer Guy". After all, he knows a thing or two about beer. And as you can see, he's pretty happy right now. Why? Because after months of self-imposed exile in Brew King's (windowless) brewing lab, Sean has emerged with Wort Works, an all-malt brewing kit of pure perfection - even by Sean's standards. You see, Sean belongs to that elite group of home brewing purists - the ones that scoff at most commercial brews and insist on choice natural ingredients for their own brewing masterpieces. With Wort Works, Sean would never cut corners. So what has Sean created? A totally unique, bag-in-a-box packaged product offering 9 litres (2 gallons) of concentrated wort made from 100% barley malt with naturally processed hops and filtered Canadian water, fully boiled in our 1000 gallon brew kettle. Sean even insisted on including a special dry hop package for extra aroma and flavour. And true to form, his instructions are comprehensive, even with information on the specific ingredients used. Sean's no dummy. He made Wort Works with his fellow homebrewers in mind, but he also made sure that its user friendly, no-boil method would be perfect for beginners too. Keep Sean happy. Make his Mom proud. Try Wort Works. The results will make you (and your friends) happy too.











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CIRCLE 7 ON READER SERVICE CARD



Kings get all the credit. First there was the Bohemian brewery that called its lager the "*Beer of Kings.*" Now the biggest brewer claims its lager, which has a similar name, is the "*King of beers.*" Both brewers would have been wise to study their history. They would find that there is a good woman behind every great beer. Women, not men, have brewed beer throughout most of recorded history. Beer queens have reigned from the Egyptian era, when they were served only the finest beers through golden straws, to medieval England and Elizabeth I, who established a connoisseurship for beer that her subjects quickly followed, to Catherine the Great, Queen of all the Russias. For shipping to Russia, brewers had to make their beer powerful, with lots of malt and hops. So great was Catherine's taste for the majestic stout that Imperial Russia became England's biggest export customer. The beer was titled, Imperial Stout.

The crown jewel in the Samuel Smith line-up of great beers, each brewed in square slate fermenters, is their finest, biggest, darkest and longest-lasting beer—Imperial Stout. In the hierarchy of beer, Samuel Smith's Imperial Stout reigns supreme. Served in a snifter after a banquet, or even a biscotti, Imperial Stout is as classic a digestive as single-malt or aged brandy. Crowned with a head of tiny bubbles like fine Champagne, her robe is black velvet, with the nature of a benevolent queen—gentle, yet powerful.

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CIRCLE 49 ON READER SERVICE CARD

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Cover photo: Todd Hammond

Resolutions: Thinking Ahead

Every year at this time my wife begins considering ways to better herself during the next 12 months. Maybe she'll decide to read a book a week. Maybe it's to do volunteer work twice a month. Maybe it's to take three classes on specific subjects. Whatever it may be, she always comes up with something, she always has a tangible way to measure it, and by the end of the year she has some accomplishment to point to.

Me, I've never been big on New Year's resolutions. I mean, self-betterment is wonderful, but I just don't like to be pinned down.

This year, I've had a change of heart. Here's how it happened.

Over the years I've accumulated a large number of 22-ounce bottles. When I first started brewing, I saved every one I could get my hands on. I stopped buying six-packs and consumed only beer packaged in large bottles. My friends saved bottles for me, too.

Eventually, I acquired enough bottles for several batches. In fact I reached the point where I had enough bottles to fill a significant portion of the garage — an area that could have been used to store other things. The car, for instance. So, demonstrating my keen sense for knowing when enough is enough, I stopped saving.

I did another thing, too. I stopped being so industrious about rinsing the bottles as soon as the beer was gone. I'd let them sit around for a few days.

I'm not sure exactly at what point the yeast in the bottom of a beer bottle mutates into concrete, but I know it occurs. And I know that with the right tools you can remove that concrete. I just know it ain't fun. And besides, I had a lot of bottles. So I started throwing them away.

Now, I've reached the point where I have just enough bottles to brew a second batch when one is bottled. If I let one more bottle grow one more concrete patch, I'm in trouble. Thus, my New Year's resolution: Drink more beer.

That is, craft-brewed beer packaged in 22-ounce bottles.

I don't expect any hitch in this year's resolution, but in case one arises, I have a backup: Get a kegging system.

I know what you're thinking. There's an easier way. Why not just ask friends to save bottles for me. Well, this isn't as simple as it sounds. They always want something in return. "Hey, Joe, can you save beer bottles for me?"

"Sure. Can you take care of my dog while I vacation in Tahiti for the next two months?"

Never mind.

All right, along with those two, I'll make one resolution for self-betterment; one to improve my self-discipline. I resolve this year to label all the bottles in each batch. No more peering through brown glass, holding the bottles to the light for any clue: Is this the last bock, or one of the latest batch of Scotch ales? No, I've changed. Those days are over.

While I'm at it, maybe I could rinse the gunk out of the carboy right away, too. No more holding the brush with two fingers, trying to get leverage while scrubbing at right angles because of the curve of the carboy. No more cranking up the heat on the hot-water tank to melt the stuff off the carboy sides. That would be a good resolution, too.

I'll have to remember it for next year.

Craig Bystrynski

Brew Your Own
THE HOW-TO HOMEBREW BEER MAGAZINE

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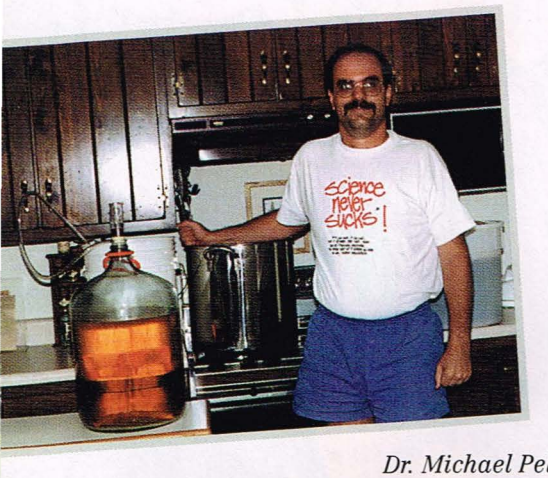
RD BYO

CIRCLE 23 ON READER SERVICE CARD

Pot Shots

Michael W. Pelter
Crown Point, Ind.

This picture shows a batch of Chablis Mead ready for bottling and a batch of Red Rye-der Ale. I've been brewing for more than six years, having started in graduate school. I hold a PhD from Miami University, and my specialty is synthetic organic polymer chemistry. I work as an assistant professor of chemistry at Purdue University, Calumet, Ill.



Dr. Michael Pelter: a man who can brew two things at once.

Tim Dozier
Roseville, Calif.

My brother and I — both experienced extract brewers — decided to try all-grain brewing. We named our first all-grain batch Dream Lager. Being our first all-grain batch, you can imagine some of the difficulties we had.

The brewing seemed to go fairly well, and we finally pitched the yeast. While we waited out fermentation for the next six weeks, our anticipation grew.

The day of consumption finally came. Boy, this brew was no "dream." In fact this was the one and only batch we have ever had to pour down the sink.

We learned many things from this dreadful experience, but the most important is not to name your beer until you have tasted it.



Brothers Tim Dozier and Ken Gillespie with their all-grain setup.

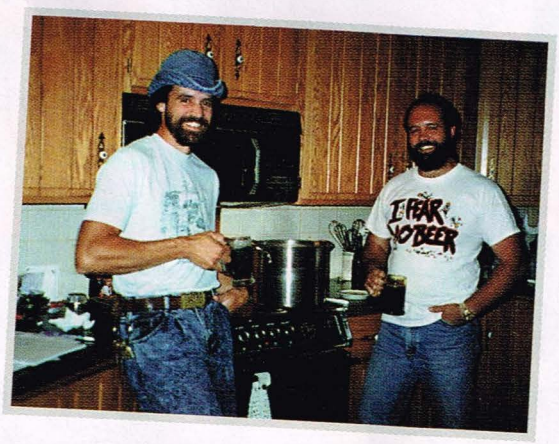
Couples Who Brew Together!

Do you like to brew with your significant other? Tell us about it and send us a picture. 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. Be sure to include your mailing address!

Russ Klase
Barto, Pa.

I had been brewing about a year and a half when my brother Rich decided he wanted to make a wheat beer that I had brewed before. We made that batch together and have now been brewing together for about six months.

So far we only extract brew, but since Rich started helping, the time it takes to brew has really been cut down. We now want to try all-grain brewing.



Be prepared: Russ and Rich Klase are ready to unwind after leading Boy Scouts meetings.

Rich and I use brewing to relax. We are both leaders for a local Boy Scouts of America troop, and we brew after troop meetings to help us unwind.

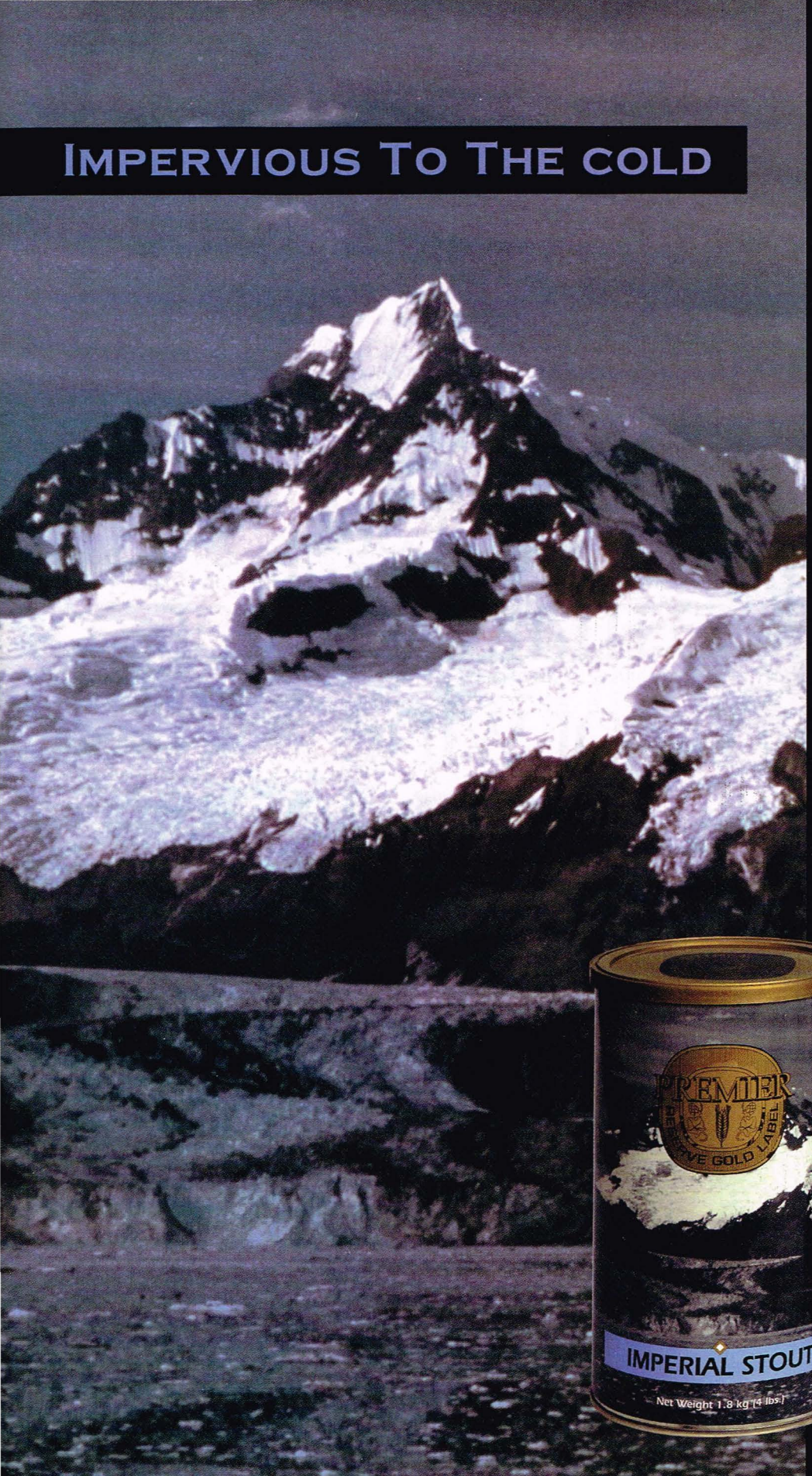
This picture shows us brewing a Scotch ale while enjoying the wheat beer that got Rich started.

Our next project is a blueberry ale experiment using the fresh blueberries that Rich grows.

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CIRCLE 8 ON READER SERVICE CARD



Hail to the Chief?

Dear Brew Your Own,

I bought your magazine in spite of the cover. How about equal time for the other parties involved. Even Ross likes a good beer!

Kevin Reagan
Columbus, Ohio

Dear BYO,

I was totally shocked and displeased at spotting the Pretender to the Throne's smirking face on the cover of your November issue. Knowing that the man would not be interested in anything that can't be snuffed up his nose, he certainly would not appreciate a fine beer.

Errol Seiffert
Billings, Mont.

Dear BYO,

If you don't mind my asking, what does that horse's ass on the cover have to do with homebrewing?

Edward J. Kendall
Little Rock, Ark.

Dear BYO,

Just wanted to tell you that I was offended to find Slick Willie staring at me in the mailbox when I picked up my copy of the November BYO.

I turn the magazine face down to avoid looking at him and now I can't find it when I want it. I expect to find a good-looking picture of Bob Dole on the cover of the next issue...equal time and all that, you know.

Robert E. Barnes
Bartow, Fla.



Dear BYO,

If he smoked and didn't inhale, did he sip and not swallow?

Paula Weber
San Francisco

Dear BYO,

I noticed your blatant preference on the November BYO issue for the future commander-in-chief. Not the photo; no, by itself, that isn't enough. It's the corner exclamation, "Four More Beers!" Thinly veiled "Four More Years," right guys? Come on! Stick to brewing, please.

Dave Kromann
Huntsville, Ala.

Dear BYO,

I received the November issue of BYO. Saw the cover. Didn't like it. It's not that you featured a picture of an elected official that I and my conservative homebrew associates dislike. Rather, it is the false depiction of the White House resident as a homebrewer. Your action has helped continue the fraud associated with the past four years. Oh, by the way, just what favors are you expecting should your man get re-elected?

Dick Pilibosian
Elbert, Colo.

Dear BYO,

Your November '96 issue contained an interesting editorial, which no homebrewer can be against, and the article "Homebrewer on Capitol Hill" contained interesting facts about homebrewers in the capital. But I can see no reason for the cover picture and two other caricatures that are political in nature to be placed in your magazine.

Robert Hall
Henderson, Nev.

Dear BYO,

I noticed in your September issue that you were interested in jokes. I see by your November cover that you found one.

Harry Hager
Atlanta

Dear BYO,

I just finished ingesting this month's issue (November '96). Good work! I read page 29 37 times. Amy Jabloner, wow! A baker and a homebrewer! Cupcakes and beer! We will forget that lawyer thing.

P.S. Clinton on the cover was a low blow. Since when does being a draft-dodging, yellow-bellied liar have anything to do with homebrewing?

L.C.
Landisville, Pa.

Dear BYO,

That front cover did it! A picture of der Schlik-Meister is the





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last straw. The depth that you will stoop to sell magazines is deplorable.

J. Kish
Clackamas, Ore.

Dear BYO,

I received my BYO November '96 issue a few days ago and was astonished to see Bill Clinton on the cover. Not only was I shocked, but it angered me greatly to have a magazine, which I had always looked forward to receiving, so blatantly politicized. Nevertheless, I counted to 10 before writing to you about this matter. Unfortunately the passage of time has not assuaged my rage, so I now would like to vent my anger and the reasons for it.

First, Bill Clinton is no homebrewer, and the story you printed, which gave you the excuse to put his face on the cover, did not justify its use. Therefore, one can only conclude that it was politically motivated.

As a veteran, I am appalled by the fact that a draft dodger is now commander-in-chief. The bumper sticker that says "unwilling to serve — unfit to lead" is right on the money.

In any event, the purpose of this letter is to express my disgust that you have allowed a good magazine to be used to help elect such a vile individual. You either approve of all his misdeeds or are a useful idiot. Needless to say, I do not want any of my money going to an organization that is either so misguided or so stupid.

Carl Jayson
Paramus, N.J.

Dear BYO,

I just got my new magazine and am considering cancelling my subscription. Just kidding, though your choice of Washington D.C. celebrities does offend me. Your magazine is very informative and entertaining. Better than most. At least I got a new picture for my dartboard. How can I justify the alcohol and tax abuse on the cover? Thanks for the laugh.

Keep up the good work.

Greg Young
Albuquerque, N.M.

Nylomaniac

Dear BYO,

Well, you guys did it again! Just when my eyes were starting to tear at the prospect of finishing the October issue, I turned the page and fell upon the Last Call column, "A Nylomaniac Tells His Story." Within a few pararaphs my eyes were still tearing but this time from laughter. The caption is right. Dave Gallagher is a man who knows what to do with a pair of nylons. His essay was a perfect way to end a great issue and also gave me an excuse to save all those Victoria's Secret catalogs that appear in our mailbox every month.

Now Dave, if you can just give us some suggestions on what to do with all those old brassieres!

Art McGray
Goshen, Conn.

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3/4 oz Northern Brewer Hop Pellets (30 min) 7.3 IBU
1/2 oz Northern Brewer Hop Pellets (5 min) 1.2 IBU
3/4 oz Northern Brewer Hops (in fermentor) 3.9 IBU
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4oz 100% Dextrin Powder
1/2 tsp Gypsum (omit if using hard water)
3/4 tsp Calcium Carbonate
1/4 tsp Calcium Chloride
1/2 oz Columbus Hop Pellets (60 min) 26 IBU
1/4 oz Northern Brewer Hop Pellets (60 min) 7.4 IBU
1/2 oz Williamette or Fuggles Hop Pellets (5 min) 0.7 IBU
1 pint Wyeast #1056 Ale Yeast Starter
OG: 1052, IBU: 34.1



Recipes created by: Byron Burch

Byron Burch is a respected authority on beer, wine & meadmaking & author of 'Brewing Quality Beers' avaliable from all good Homebrew retailers.

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CIRCLE 24 ON READER SERVICE CARD

Coffee-Inspired Lager

by Scott R. Russell

I am a child of the '70s. There is no denying it. My psyche, my tastes, and my memories were all forged, for better or for worse, by the decade in which I endured my teenage years, high school, first love, first heartbreak, Carlton Fisk and Johnny Bench, Jim Rice and Bucky Dent...Er, sorry, but there are some heartbreaks I'd prefer not to bring up. I also tried my first beer in the '70s (no, that thimble-full of Carling Black Label on Dad's knees at the age of 3 doesn't really count). So the '70s, like them or not, are in a large way responsible for all that I am.

When I began brewing my own beer several years ago, the '70s were well behind me (or so I thought). I was not thinking about the Brady Bunch, the Partridge Family, disco, Watergate, and other familiar '70s symbols when I brewed my first batch of pale ale. In fact my first several batches did not have names or themes. They were just homemade beers, a novelty, a new hobby to try, and they were basically from kits made by professional homebrew kit designers in professional homebrew shops. Now that I am in that creative professional position myself, I derive no end of satisfaction from not only creating a great recipe with high-quality ingredients but also giving it a clever and memorable name.



Want a strong German ale? How about Mjollnir, named after Thor's magic hammer. A very strong Oktoberfest-style brew that can be

Café Vienna
(5 gallons, partial mash)

Ingredients:

- 1 lb. Vienna malt
- 0.5 lb. dark Munich malt, 10° to 12° Lovibond
- 0.25 lb. malted wheat
- 1 lb. lager malt
- 4 lbs. unhopped amber malt extract syrup
- 1 oz. Perle hop pellets, for 60 min.
- 0.5 oz. Hallertauer hop pellets, for 20 min.
- 0.5 oz. Spalt pellets, for 20 min.
- 0.125 lb. coarsely cracked (not ground) light-roast coffee beans
- 1 broken cinnamon stick
- 14 g. dry lager yeast or liquid culture
- 3/4 cup corn syrup

Step by Step:

Heat 1.5 gals. of water to 132° F, crack and mix in malts and malted wheat. The mash should settle at 121° F. Hold 30 minutes, then remove 3 qts. of liquid from the mash and boil it 15 minutes. Stir heated mash back into the mash tun. This should raise the whole mash to 137° F or so. Hold another 30 minutes, then remove 3 qts. again and bring to a boil. Boil this 15 minutes, add it back to the mash tun, raising the whole to about 152° F. Hold here for 60 minutes, then lauter and sparge with 2 gals. of 168° F water. To this runoff (about 3 gals.) add extract syrup and bring to a boil. Add Perle hop pellets, boil 40 minutes. Add Hallertauer and Spalt pellets, boil 20 minutes.

Remove from heat, set in ice water to cool, and add coffee beans and cinnamon stick. Steep at least 15 minutes, then chill and top off to 5.25 gals. with pre-boiled chilled water. At 75° F pitch dry lager yeast or a liquid culture (I've had great luck in this recipe with Wyeast 2308 Munich). Seal and ferment for two days at 65° to 70° F, then place in a cooler (50° to 55° F) for a week. Rack to secondary and, if possible, place in a cold place (40° F or below) for three to six more weeks. (Otherwise, maintain at 50° F for three or four weeks.) Prime with corn sugar and bottle. Age cold (40° to 50° F) six to eight weeks, space permitting.

Notes:

Experienced decoction mashers will probably laugh at this primitive partial-decoction-mash recipe. I know it is not quite a usual triple decoction, but it seems to work for this recipe. If you have a better all-grain Vienna recipe, go with it. If you are going to mash at all for this recipe, I strongly encourage you to try it as a decoction, if only for the lovely color you can produce by boiling the mash.

Extract brewers who can't even partial mash, don't worry; an additional pound of amber dry malt extract will give you enough body and fermentables to make this work. I would suggest steeping some cracked Munich (see mash recipe) in your brewing water before you add the extracts, for color and grain aroma.

Dark-roasted coffee should be avoided, because it will darken the beer. You want to give a hint of coffee and cinnamon, not make them the dominant flavors, so don't steep them in the cooling wort too long, but just long enough to give some brownish color and coffee-cinnamon aroma.

fermented as an ale? I called mine Knocked-over-fest. I made a honey pilsner called Mind Your Own Beeswax, and a dark Scottish ale with (too much!) peat-smoked malt titled TarMac. You get the picture. As I once wrote here (in reference to my Coconut Brown Ale), the name sometimes precedes the recipe.

And here is where the '70s connect with all this (be honest, you were wondering, weren't you?). One of the greatest food products (in my opinion, of course) to come out of the '70s (after Hamburger Helper, naturally) was a line of fancy instant "coffees" with exotic flavors, such as cinnamon, chocolate, and mint, that were smooth, sweet, and expensive. In hindsight now that I have become a coffee junkie (and snob, as well), I must admit that they do not have the same appeal they once did. But one name has always stayed with me as an emblem of that golden age: Café Vienna. Now, I have never been to Austria. The closest I have come to Vienna is the Von Trapp family lodge and coffee shop in Stowe, Vt. (yes, founded by the Colonel and Maria after escaping the clutches of the bad guys at the end of "The Sound of Music"). But when I gained a bit of brewing knowledge and discovered there was a style of lager native to Vienna, that name resurfaced. What could I add to a Vienna lager to make Café Vienna? The result is sweet and rich, subtly spicy, delicious at any temperature or in any season. But I will always associate it with cold winter afternoons watching mittens dry and snow fall, listening to my old Partridge Family and Archies albums.

Reader Recipes

Irish Creme Stout
(5 gallons, all-grain)

This recipe creates a smooth and slightly roasty ale that is very drinkable. To obtain the Irish Creme flavor I have had the best results from flavored syrups used in coffees. To test how much to use, add the amount recommended for coffee to a beer similar to the type you intend to brew and then adjust the taste. Multiply that result by the number of bottles in the finished batch to determine how much to add to the secondary. Remember, most of these are corn-sugar based, and the sweetness will be reduced in the brew.

Vince Weibert
Clovis, Calif.

Ingredients:

- 8 lbs. two-row pale malt
- 12 oz. crystal malt, 60° Lovibond
- 12 oz. flaked barley malt
- 4 oz. chocolate malt
- 3 oz. roasted barley malt
- 4 oz. Belgian Special B malt
- 1 oz. Northern Brewer hops (6% alpha acid), for 80 min.
- 4 oz. lactose, for 80 min.
- 1/2 tsp. Irish moss
- Irish Creme syrup
- Wyeast 1084 Irish Ale
- 3/4 cup corn sugar

Step by Step:

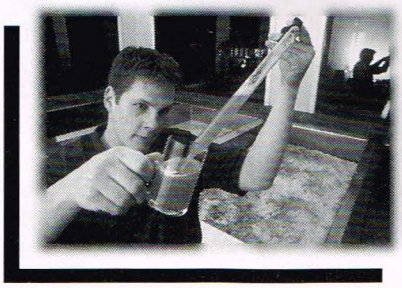
Use a single-infusion mash. Bring 11 quarts of water to 163° F and add to grains in pre-heated mash tun. Temperature should stabilize around 153° F. Hold at this temperature for about one hour, then bump it up to 165° F and hold for five minutes. Bring sparge water to 175° F and sparge until the original gravity of runnings drops to 1.005 when adjusted for temperature.

Bring to a boil. Boil 10 minutes and add the hops and lactose. Boil 65 minutes and add Irish moss. Total boil is 90 minutes. Cool, rack, aerate, and pitch in primary fermenter.

After primary fermentation subsides rack to secondary and add Irish Creme syrup. The syrup should be sanitized by immersing the entire bottle in a pot containing 180° F water and holding it there for about 10 minutes. Cool it before adding to secondary. You might notice signs of fermentation in the secondary as the yeast goes to work on fermentables in the syrup.

After seven to 10 days in secondary, prime with corn sugar and bottle.

OG = 1.056
FG = 1.019 ■



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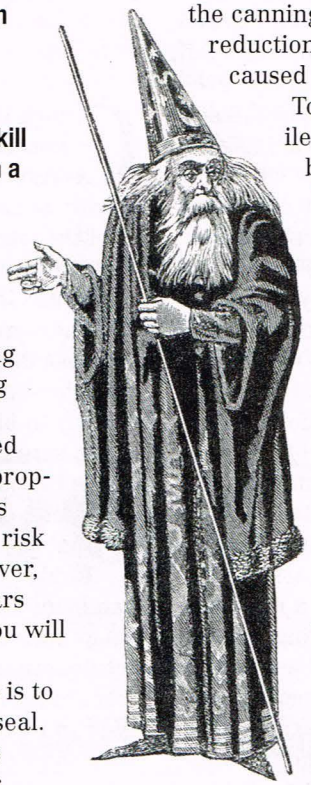
CIRCLE 2 ON READER SERVICE CARD

When Good Wort Turns Bad

Mr. Wizard

I'm the big chicken on my yeast ranch and am scared that my stored wort for preparing starters could be contaminated. I think I can pre-boil the wort to get rid of any bacteria, but I'm wondering if my microwave could speed up the process. Could boiling wort (small quantities) in my microwave kill bacteria and leave my wort in a stable state?

Chris Harris
Chicago



I'll be damned, it's Foghorn Leghorn writing in about a homebrewing problem! There's nothing wrong with being concerned about the sterility of your propagation wort because if it is contaminated, you run the risk of ruining your beer. However, if you can wort in mason jars using a pressure cooker, you will know if the wort goes bad.

Diagnostic number one is to check the jar for a proper seal. A broken seal indicates the production of gas in the jar, which only occurs if your canning process was inadequate, allowing bacteria to grow in the jar.

However, not all bacteria that contaminate wort produce gases when they grow. Many wort spoilers, such as certain strains of lactic-acid bacteria, will grow in wort and produce off flavors without producing any gas. The presence of these critters is usually easy to detect by tasting a portion of your propagation wort. If it tastes like wort, then it's most likely fine. However, if you pick up sourness, rotten-egg-like sulfur, diacetyl (buttery), or any other nasty taste, then don't use it.

If the wort tastes fine and you still want to re-sterilize it, you can use a microwave oven. However, your microwave will save time only in getting the wort up to the boil. Whether wort is boiled in a microwave or on the range, a minimum of 20 minutes is still required to provide significant thermal kill. Thermal kill is the term used by the canning industry to describe the reduction in a bacterial population caused by thermal exposure.

To consider your wort sterile, "commercially sterile" to be accurate, it is best to boil it for 20 minutes under 15 to 20 pounds per square inch above atmospheric pressure. This will elevate the boiling temperature and provide much more thermal kill per minute of boiling than ordinary atmospheric boiling. To do this you must use a pressure cooker and mason jars.

After canning your wort by this method, you can check the success of canning by the presence (or absence) of bulging tops. We now come full circle!

If it's properly canned in a mason jar by using a pressure cooker to begin with, you need not be the big chicken on your yeast ranch any longer.

Mr. Wizard

Being English I am a keen drinker of what we know as "beer," i.e. the strong-flavored brown stuff. I am new to the magazine. Does it deal mainly with the yellow stuff we know as "lager"?

My question is this: What is the difference between beer and lager? I've heard tell that it's to do with bottom-brewing and top-brewing, or something like that (I was told this in a pub, and I can't quite remember the terms).

Also, why is it that every American I've met who has voiced his opinion on the subject has claimed that UK beer is a stale-tasting, unpleasant abomination, and could they possibly have a bottle of lager, if that's all right? Are you missing something? Or are we?

John Osborne
Dallas

In order to answer this long list of questions, let's begin at the top. BYO does not deal with the yellow stuff ("lager") simply because the magazine is published in the United States. Rather, it also deals with all the wonderful types of beers (ales and lagers are both "beer") brewed throughout the world. Pale lagers, pale ales, brown lagers, brown ales, black lagers, black ales, fruit beers, wheat beers, Belgian ales, and many others. We cover them all. Simply put, BYO covers the entire range of beer styles.

What you refer to as "beer" in your letter most American drinkers would call "ale." Ale is made with one of the two types of yeasts, the so-called top-fermenting strains, which form a dense crop of yeast at the top of the fermenter. The yeast stays on top even after vigorous fermentation has subsided.

Lagers are made with the other type of yeast, "bottom-fermenting" yeasts, which tend to collect on the bottom of the fermenter, or bottom crop, after vigorous fermentation.

In addition to these differences, ales tend to be fermented at room temperatures (65° to 70° F) and lagers tend to be fermented at cooler temperatures (50° to 55° F). In general ales have short, warm maturation periods and lagers have long, cold maturation periods. This is where the generalizations end.

Ales can be any color from very, very pale yellow to jet black, and the same is true of lagers. Some lagers tend to be quite bitter with pronounced

hop aromas, while others have very subtle hopping. Again, the same is true of some ales.

Regarding carbonation, cask-conditioned ales are the least carbonated beers in the world, while some of the German and Belgian wheat ales are the most carbonated beers in the world. Lagers tend to have a narrower range of carbonation.

On to your query about the American opinion of UK ales. I have heard the same comments in this country about the warm, flat, stale-tasting UK ales from consumers of bland American lagers. However, beer connoisseurs from this great land certainly do not share this opinion.

In fact the interesting flavors found in UK ales, and of course the lack of interesting American beers in the mid-1970s, are credited as the primary catalysts for the homebrewing and microbrewery movement in the United States.

Most of the microbrews brewed in the United States are loosely modeled after UK ales, and the microbreweries brewing lager beers have focused their efforts on the full-flavored lagers of Germany, not the lightly flavored lagers of North America. In short not all Americans have such a negative opinion of your country's fine ales.

Are we missing something? For the beer connoisseur the United States may be the home of some of the most exciting changes in the beer industry in the last century.

Are you missing something? Well, since the explosion of microbrews has begun cutting into US domestic sales, the big American brewers are beginning to produce their light-flavored products in other countries. In fact Budweiser is the fastest-growing brand among your country's youth! It seems our national preferences in beer may be moving toward a similar landscape: lots of bland, yellow lager and a small but vocal class of real beer drinkers.

Mr. Wizard

I have become very involved in homebrewing lately, and I have had great success in my efforts thus far. I plan to make the art of brewing a hobby for a lifetime and wonder how one can become an official "brewmaster." I've seen people in BYO introduced by such titles and thought that it would be an honor to attain such a title. Please enlighten me.

Sean Smith
West Plains, Mo.

The term brewmaster has become more common in the United States as the number of breweries has exploded. The current meaning of brewmaster seems to be any brewer who is the head honcho of his or her commercial brewing operation. This definition means that every brewery has one brewmaster. Unfortunately, there are some brewmasters who are the head honchos of their breweries but have no other qualification to go along with their grand title.

In most well-established breweries throughout the world, the brewmaster is not only the head honcho of the brewery but is also formally educated in brewing science and engineering and has extensive practical experience.

Some countries have universities and membership organizations that administer what members of the international brewing community acknowledge as "brewmasters" examinations. The Institute of Brewing in London administers the Associate Membership Examination, a nine-hour test (three exams each lasting three hours) covering theoretical aspects of brewing science and engineering, and the Diploma Membership Examination, an 18-hour test (six three-hour exams) covering the practical aspects of brewing, open to all brewers.

Students from Herriot-Watt University in Scotland are automatically granted membership at the associate level upon completing their degrees in brewing, and students at the University of California, Davis, who study in the Masterbrewers program take this examination at the end of their studies.

There are several brewing schools in Europe, such as the Tecnhical University of Munich, Weihenstephan, that also grant brewmaster degrees.

Mr. Wizard

I'm a dazed and confused single-step infusion brewer. Although I have received numerous confusing and seemingly ridiculous answers to my questions, I have yet to obtain a reasonable answer for any of them. 1) When measuring specific gravity, is the original gravity taken during the mash, boil, or after the wort has cooled? 2) Is the final gravity taken during the primary or secondary, and how is this accomplished without infecting the brew? 3) I am working on a strawberry wheat brew. Should I add the strawberries during the mash or the boil? When is this step taken and what is the preferred method for adding fruit?

Tim Allan
Cincinnati

Check the specific gravity of the wort after the boil to determine original gravity. Because original gravity is defined as the specific gravity of the wort before fermentation, this is the only point in the process to determine it.

There are good reasons to check the specific gravity of the wort during sparging and during the kettle boil, namely to hit the target gravity and to make sure that excessive sparging doesn't occur. However, these measurements are very different than the original gravity measurement.

Unlike original gravity, final gravity can be determined at many stages in the process. It can be checked once fermentation is complete and sampled from the primary fermenter. The sample can be taken from the secondary fermenter or from a bottle or keg. In all cases the specific gravity of the beer will be the same because fermentation is complete. There are exceptions to this rule: bottle-conditioned beers or beers with additives such as honey or fruit added after fermentation. These beers have different specific gravities before and after the addition of such materials.

The best method of sampling beer from a fermenter involves a device known as a "thief." A thief is a large-diameter, turkey-baster-like thingymabob with a small hole in each end. The brewer simply inserts the sanitized thief into the fermenter, covers one end with his thumb, and removes the thief. Most homebrew or home winemaking stores should have thieves in stock or should be able to

order them.

Question three is a little off the wall, and my answer is going to sound even crazier. I have brewed strawberry beers before, and I prefer adding the fruit to the beer after fermentation is complete. This is risky if the fruit is contaminated with yeast or bacteria, which it most likely is, so you might want to add some potassium metabisulfite (Campden tablets) to the juice before adding it to beer. As an alterntive, you can heat the fruit juice to 180° F and hold it at that temperature for 20 minutes to kill these natural contaminants. After adding the fruit there may be a secondary fermentation depending on the yeast content and health in the beer.

I usually filter such beers to remove the yeast and prevent any secondary fermentation of the fruit sugars. If you don't have a filter, the beer can go through a secondary fermentation, or it may be kegged, artificially carbonated, and kept very cold (32° to 34° F) to prevent the possibility of any fermentation. All of this hassle is in the name of sugar preservation. If the fruit sugar can be preserved, your fruit beer will taste much fruitier than if you let the fruit sugar ferment.

Mr. Wizard

I recently brewed a specialty extract brown ale spiced lightly with one ounce of fresh ginger and three inches of a cinnamon stick in the initial grain steeping. I hopped for flavor not bitterness, and the beer tasted great throughout the process and still tastes great in the bottle. However, it is not conditioning very well. It has been 10 days and the carbonation is barely there. I know there is a good seal because the pffft sound is happening when I open one. I realize seven to 10 days is the recommended time for conditioning and I should probably just relax and wait another week or two, but my other seven batches of beer conditioned much faster. Is this just normal variation? Here are some variables to help you understand my beer better:

Original gravity, 1.050; final gravity, 1.011; pitching temperature, 75° F. I used German Ale Wyeast.

Andy White
Albany, N.Y.

The two most important things to consider before adding priming sugar to your fermented beer and bottling it are a) the volume of beer you wish to carbonate, and b) the amount of carbonation you want in the beer.

Assuming you rack your fermented beer to a bottling bucket on bottling day, determining volume is easy. I recommend fixing a strip of masking tape to the outside of the bucket and calibrating the tape by adding a quart of water to the bucket at a time and placing a mark on the tape for each addition.

Volume is important because the amount of priming sugar depends on the amount of beer being carbonated. Even if you always brew the same batch size, the volume of beer to be carbonated varies because some beer

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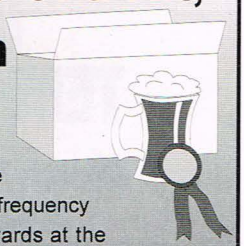
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may have been lost during fermentation through blow-off, and the amount of beer left in the primary after racking varies with the fluffiness of the yeast.

The second question is: How much carbonation do you personally desire? I can't help you on this decision, but let's just say your last brew was carbonated to your satisfaction and that you added 2/3 cup of priming sugar to 4.25 gallons of beer. That works out to be 0.157 cups per gallon of beer. One cup is roughly the same as 237 milliliters. Using the metric system we get 158 milliliters of priming sugar per 4.25 gallons or 37 milliliters of priming sugar per gallon.

The next time you brew and get ready to bottle you can use this figure. Suppose you have 4.75 gallons of beer and want to know how much priming sugar to add. This is easily determined by multiplying 4.75 gallons by 37 milliliters of sugar per gallon — you need 175.75 milliliters of sugar. This is equal to about 3/4 cup. In a small volume of beer, the carbonation produced by 2/3 cup versus 3/4 cup is the difference between fully carbonated and under-carbonated.

Unfortunately, I don't have any wonder cures for your current beer. However, if in the future you keep track of the volume of beer being carbonated, the amount of sugar used, and your thoughts about the level in the finished product, you will soon have enough carbonation data not only to know the level you personally prefer but to reproduce the level time and time again in future beers. ■

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.

Elevated by popular acclaim to the position of Royal High Dictator, Mr. Wizard spread brewing knowledge to every corner of the small Pacific island where he had chosen to spend his vacation. He returned home with a box of chocolate-covered pineapples and the feeling of a job well done.

Maintain Consistency from Batch to Batch

by Suzanne Berens

Little Apple Brewing

Brewer: Robert Moline
Brewery: Little Apple Brewing, Manhattan, Kan.
Years of experience: Eight
House Beers: Wildcat Wheat, Custer's Gold (American blond ale), Fort Riley Rye, Big Red Ale (amber), Prairie Pale Ale, Pony Express Porter, and Black Angus Stout

"One of the most important principles in creating consistent beers is keeping good records on what you do for every batch. There's nothing worse than making a jamming beer and realizing you don't know what you did to make it that way."

Brewer: Robert Moline



One of the best ways to guarantee consistent-tasting beer is by sampling your beer at every stage of the process. As soon as the wort is chilled, I pull off a sample to measure the gravity and then I taste and smell it. Next, I transfer the beer into my secondary for conditioning, have a sip of it, and measure the gravity. I prepare the beer for carbonation — we force carbonate — and have a sip of the beer and check the gravity. When the beer is ready to be put on the line to the customer, I check the gravity and have a sip of it.

Rigorous adherence to your formulas and procedures is very important as well. For example make sure you monitor the pH balance of the mash and sparge water, and check the lot numbers on your bags of grain. When you buy grain, there's a range for each style. If I buy a bag of two-row malt, I know what range the color will be in.

But when you get the individual bag, it's got a lot number on it. You can get a sheet from the manufacturer of the malt that lists the lot numbers and their colors. The color will fall within a range, but for each lot it could be a little higher or it could be a little lower. If the color doesn't match our recipe exactly, we make adjustments up or down. Some manufacturers are very consistent from batch to batch. It helps to find a consistent product to begin with.

The major times we've had inconsistencies are when, by accident, we've ended up with the wrong bag of grain. We had one such episode recently. The grain bags have colored tags on the ends that specify what they are. For example a blue tag indicates this is a Munich malt with a specific lot number. You might have another bag that's got a blue tag on it that says this is cara-Munich malt.

One of my assistant brewers thought he was picking up one bag of grain, and he was actually putting in another. As he put the empty bag of grain in the dumpster to get rid of it, he discovered he'd made the mistake and the beer would not have enough color. We had to come up with some plan quickly to get our color back up.

When you run into inconsistent ingredients, compensate for them. The easiest inconsistency to correct is your hop rate. Little variances in your alpha acids can affect flavor, especially in lighter beers.

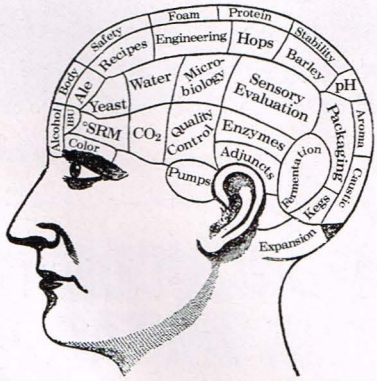
If you're used to using a hop, say Galena, that comes in at 10 percent alpha acid and the next batch of Galena you get in is 12.2 percent, then you have to make adjustments.

The easiest way to adjust is to break down into units what you're used to using. If you're used to using one pound of Galena with 10 percent

The Tips

- **Taste your beer at each stage, starting from the time the wort is chilled to just before serving it.**
- **Stick to brands and types of ingredients that are consistent, and always check them against the manufacturer's description in case you need to adjust them.**
- **Calculate adjustments to correct variances in alpha-acid rates and water.**
- **Keep detailed records of each batch you make. Include such things as the temperature of water you strike in at and the procedure you use for making a starter culture of yeast.**

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CIRCLE 47 ON READER SERVICE CARD

alpha acids, you would multiply 16 (16 ounces) by 10, which is 160. So you're looking at 160 units. The hop you have in now is 12.2 percent. You divide 160 by 12.2, which tells you that you need 13.1 ounces instead of 16 ounces of hops. It works in the opposite direction, too. If you are using 16 ounces of 10 percent alpha acid, still at 160 units, then all of a sudden your hops are down to 9.1 percent. You divide 9.1 into 160, and it tells you you're going to need 17 or 18 ounces of hops.

As a homebrewer, ensuring consistent-tasting beer also starts with consistent products, including water. If your municipal area can't supply you with consistent water, then you have to start analyzing your water and adjusting it. I've homebrewed in Manhattan, Kan.; Savannah, Ga.; and Tallahassee, Fla. As far as I'm concerned, you can make a good batch of beer as a homebrewer if the water tastes good.

Extracts should be consistent, too. Some liquid extract companies make outstanding products. Others make products that are adulterated with corn sugars and various other things. You need to experiment.

One of the most important principles in creating consistent beers is keeping good records on what you do for every batch. There's nothing worse than making a jamming beer and realizing you don't know what you did to make it that way. How much water did you strike in with? At what temperature? I'm talking all-grain, but good record keeping applies to extract brewers, too. At what temperature did you start? At what temperature did you pitch your yeast? What procedures did you use for reconstituting your yeast if you used dried yeast? What chemicals did you add to your water to acidify for sparging or mashing?

Following instructions is important for consistency, but the biggest mistake homebrewers make is following the instructions regarding the addition of dextrose that come with kits. The only thing dextrose should be used for is priming beer. Do that one simple thing and 99 percent of extract beers in this country would improve markedly. It would do so much toward persuading people's friends to believe that this (homebrew) is a decent product. ■

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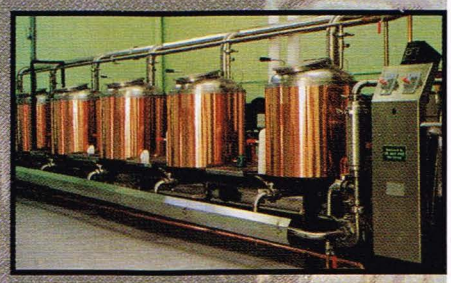
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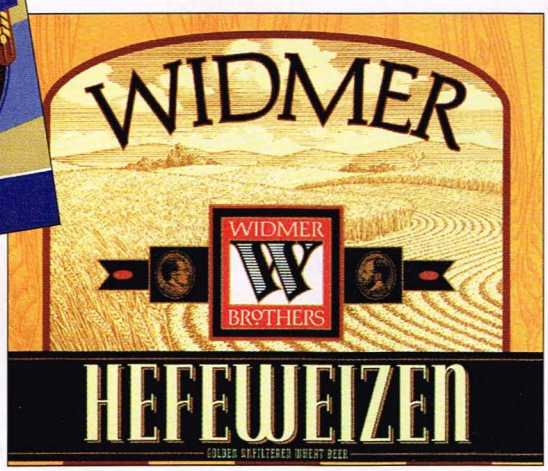
Charting the New American Wheat Beer

by Jeff Frane

The microbrewery revolution in the late 1980s introduced Americans to an abundance of flavor that had been missing from their beer — if not altogether, at least for a long time. For the most part that flavor came from hops. It was as though brewers had just discovered hops and how they could add bitterness and flavor; they tended to go wild with them, sometimes completely overboard. Pyramid Pale Ale was so drenched in Cascade hops that one glass would ruin a drinker for any other beer that evening — you couldn't even taste anything else. Bridgeport Golden Ale (gone now, alas) originally was so thick with hops that the lupulin coated the roof of your mouth. A number of beer drinkers became instant hopheads, but the flavors weren't for everyone.

Unfortunately for hop freaks there just weren't enough of us around to sell beer to. After all, Americans had been told for years that bitter is bad, and the idea of beer with a lot of flavor seemed alien to most people. In response to this less-than-enthusiastic reaction to hop teas, microbrewers began to experiment with a different approach: brewing beers with a bit less intensity and a lot less hop presence.





In England brewers had always offered two basic options for the drinker: bitter and mild. People who liked their beer with some bite drank bitter, and those who favored malt and richness drank mild. During the microbrewery surge the term "mild" never caught on (and marketers tended to steer away from references to "bitter"), but the concept did. What emerged as the American mild was the American wheat beer, a beer that profiled the malt and downplayed the hops.

There's a certain amount of bickering about where the first new American wheat beer appeared, but it was probably an experimental offering by the Anchor Brewing Co. Other versions appeared in the Northwest, including a wheaten ale from Pyramid. What is not arguable, I think, is which brewery had the greatest success with a wheat beer and persuaded virtually everyone to include a version in their line of beers.

Here in Portland, Ore., Widmer Brewing Co. got into microbrewing with a beer that appealed to a real hard-core beer fan, a true-to-style Dusseldorfer altbier that was rich, intense, and very bitter. Great stuff but with a limited market. Other seasonal beers appeared that were less demanding and found a greater appeal, but it was with the release of its "weizenbier" that Widmer really found its niche. And it was the brewery's "hefeweizen," an unfiltered, murky beer invariably served with a slice of lemon, that propelled Widmer into the lead in Oregon's highly competitive market.

Widmer's wheat beer has retained its appeal over the following decade. Oregon has a much wider draft sale than most regions of the country, and Widmer's hefeweizen was second only to Budweiser in sales (although still way behind Bud). This spring the beer

appeared in bottles for the first time and swamped the retail market.

Throughout the region and around the country American wheat beers (sometimes with the addition of fruit flavors) have developed an amazing popularity, accounting for a significant portion of the craft brewery market. American beer drinkers still, apparently, aren't especially comfortable with heaps of hops. However, they seek some more flavor in their beer and, perhaps, want to catch a ride on the craft-brewery bandwagon. Like their Bavarian counterparts, they seem to view unfiltered wheat beers almost as health food, a rich source of vitamin B.

In Europe wheat beers have a lot of character. Bavarian weissbiers are rich in clove, vanilla, and fruity flavors, while Belgian witbiers are spiced with coriander and bitter orange. Distinctive yeasts and a high proportion of wheat in the grist help the beers stand out from more "mainstream" lagers and pils.

American wheat beers, by contrast, are considerably toned down, although generally with much more malt flavor than in the basic American pilsner. Most are top fermented, using the same yeast strain the brewery uses for its line of ales, but bigger breweries are beginning to produce similar beers using lager strains. For example Blitz-Weinhard Brewing Co. in Portland, Ore., brews a very credible version with a lager yeast (and honey).

What isn't obvious is how much difference the contribution of malted wheat really makes to these beers. In Bavarian weissbiers the high (60 to 70 percent) proportions of wheat affect the flavor, color, and even the dense head, but in American wheat beers the proportions are lower (30 to 50 percent), and the critical decoction mash is eliminated. American wheat beers rarely look different from blonde ales, except that they tend to be clouded by protein haze. It seems likely that a fairly small amount of malted wheat could be included without changing the beer's character much, as long as hopping rates are held down and an emphasis on malt flavor is continued.

Unfiltered versions, of course, are often served with a dense haze of yeast. At one time Widmer responded to customer demands by changing its racking process to increase the amount of yeast carried over into the kegs; hefeweizen fans objected to beer that was too clear.

In general American wheat beers are pale. Dark versions ("dunkelweizens") appear but lack the overall appeal of the paler beers. In some cases, of course, fruit extracts have been added and the beers take on some color (pink or even blue!) from the fruit, but even then, the contribution is not great.

The malts chosen for these beers are simple: pale lager malt (two-row), some pale caramel malt (cara-pils is common) and, of course, some malted wheat. Richer, highly colored caramel malts don't work well in producing a very pale beer, although they might be included in very small portions. In the early experimental days Pyramid Breweries Inc. fiddled with a roasted wheat malt, but the beer never caught on. I recently discovered cara-wheat in the market, and it might be an interesting ingredient for the experimentally minded homebrewer.

Extract brewers need not be left out. Wheat malts are now widely available in extract form, either pure or blended with malted barley. I look for the palest possible brands, such as Alexander's. For added body some cara-pils malt and some pale lager malt can be used in a mini-mash and added to the extract wort.

As pseudo-Bavarian beers, many American wheat beers are hopped with German varieties or, more likely, American clones of German varieties. But the familiar Cascade and other American hop varieties are widely used. In fact a blend of continental and American hops may be considered essential to a true American wheat beer. Because bitterness and hop presence is subdued in these beers, low-alpha hops are the best bet (at about 7 percent Cascades are pushing the upper edges and need to be used with caution). New strains, such as Mt. Hood, Liberty, and Ultra, are good choices, along with traditional varieties such as Tettnanger and Hallertauer. Willamette, a very floral variety, works well blended with the Continental types.

Any good ale yeast is appropriate, especially one with a neutral profile. Fruitiness isn't a common characteristic

Half a Weizen

(5 gallons, partial mash)

Ingredients:

- 4 lbs. Alexander's wheat-barley malt extract (60-40 blend)
- 3 lbs. Briess dry wheat-barley malt extract (65-35 blend)
- 1 lb. crushed lager malt
- 0.5 lb. crushed caramel malt, 10° Lovibond
- 1.5 oz. Cascade hops (7% alpha acid), 1 oz. for 75 min., 0.5 oz. for 30 min.
- 1 oz. Tettnanger hops (3.5% alpha acid), for 30 min.
- 1- to 2-qt. starter of good yeast (Widmer Hefe-Weizen or Wyeast 1007)

Step by Step:

Soak lager and caramel malts in 0.5 gals. of water at 150° F for 45 to 60 minutes, then sparge into kettle.

Add extracts and enough water to bring to 2.5 to 3 gals. Boil 15 minutes and add 1 oz. Cascade hops. Boil 45 minutes and add Tettnager and 0.5 oz. Cascade hops. Boil 30 more minutes. Total boil is 90 minutes.

Cool by adding to pre-boiled, chilled water, to bring to a total volume of 5 gals. Aerate thoroughly.

When wort reaches 70° F, pitch yeast. Follow normal fermentation and bottling procedures.

OG = 1.045
TG = 1.010

of American wheat beers, so some of the more estery British strains probably wouldn't work well. Widmer, for example, uses a German top-fermenting strain from a Dusseldorf alt brewery (try culturing some from the bottle) that emphasizes malt. Most yeast companies carry a similar strain. Certainly the most prevalent brewpub yeast is the "Sierra Nevada" strain, Wyeast's 1056. Brewers love this yeast because it is vigorous, works in a wide range of temperatures, and is very neutral in flavor — definitely appropriate for American wheat beers.

Brewing these wheat beers, even from all-grain, is very simple. A two-step infusion mash can be done to include a protein rest, but many brewers use a single British-style infusion mash, at about 150° F. Because some haze is typical of the style, it isn't necessary to struggle too much with the proteins from the wheat. Higher temperatures (around 155° F) will increase the maltiness of the beer. Original gravities are moderate, around 1.045, much like a standard pale ale.

The same methods used for fermenting and bottling ales are followed for American wheat beers. They are best served fresh (they're unlikely to need, or benefit from, any aging) and fairly cool. Diehard yeast gobblers can roll the bottle before pouring or swish the last few ounces of beer to disturb the yeast sediment. Adding a slice of lemon can give the beer a little zip and a refreshing tartness. ■

American Wheat

(10 gallons, all-grain)

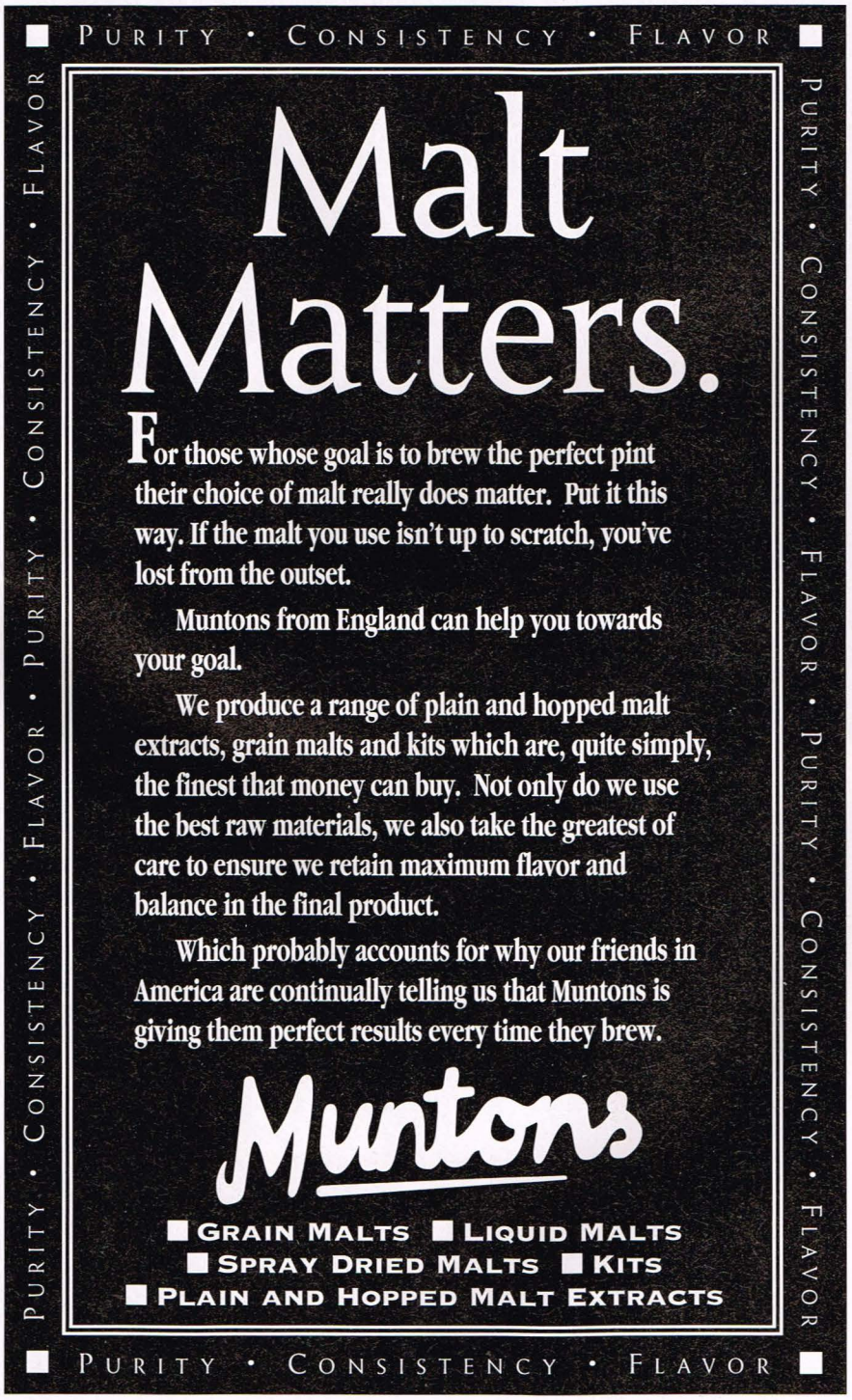
Ingredients:

- 10 lbs. wheat malt
- 6 lbs. two-row lager malt
- 2 oz. Northern Brewer hops (7.2% alpha acid), for 75 min.
- 1 oz. Mt. Hood hops (3.2% alpha acid), for 30 min.
- 2- to 3-qt. starter of good ale yeast (Wyeast 1056)

Step by Step::

Mash in with 4.5 gals. of water at 130° F and hold for 30 minutes. Raise to 155° F and hold until iodine test is negative. Sparge to 11.5 gals. and boil for 15 minutes. Add Northern Brewer hops and boil 45 more minutes. Add Mt. Hood hops. Boil 30 more minutes. Total boil is 90 minutes. Cool to pitching temperature, aerate thoroughly, and pitch yeast. Follow normal fermentation procedures (at 65° to 70° F), rack to secondary, and bottle when fermentation is complete (about 10 to 14 days).

OG = 1.045 to 1.047
TG = 1.006 to 1.009



DESCENT INTO THE MALTSTROM

A HOMEBREWER'S STORY

With my bag of beer fixings in one sweaty palm, I left the AMC Gremlin smoldering in the driveway and entered the house. Stepping across the threshold, I loudly announced a family meeting. Instantly I heard the patter of rapidly moving feet and the whoosh of three doors closing as my loving wife and children went AWOL.

Reasonably certain that I would be left alone for at least three hours, I went about preparing to create my first batch of beer.

by David J. Gallagher



SHAWN TURNER ILLUSTRATIONS



Having sanitized the kitchen prior to leaving for the brew shop, I merely laid out the clean fermentation bucket, cover, and fermentation lock within easy reach, then went to the closet to retrieve our largest boiling pot.

To comfortably create a wort for five gallons of beer, I found out the hard way that one needs to boil at least two, and preferably three, gallons of water in a pot that leaves room for an additional gallon of liquid. (Two gallons of cold water are placed in the fermentation bucket. The boiled wort is then added to this water to bring the total volume to five gallons. This also cools the wort.)

Our largest pot held two gallons of water when filled right to the lip. Of course I only filled the pot seven-eighths of the way, leaving an inch or so between water level and the pot lip to allow for the added volume of the ingredients as it all bubbled into a tasty concoction. I placed the pot on the front burner and turned on the gas. I was an old hand at boiling water, at least under supervision, so my confidence — coupled with being alone in the kitchen for the first time — really heightened the magic for me.

While waiting for the water to boil, I measured 3.25 gallons of water into the fermentation bucket, laying the lid on top as The Book suggested to keep out unwanted organisms, like that stuff from The Andromeda Strain.

I then set out the ingredients. The can of malt extract syrup, bag of dried malt powder, containers of hops pellets and mesh bag, and packet of ale yeast were placed on the counter next to the stove in order of need. The biggest stirring spoon we owned held the position of honor dead center on the stove. It was time to begin.

Per instruction I removed the label from the can of malt extract syrup and placed the can in a smaller pot of water to heat. The Book indicated that warming it would make the syrup easier to pour. I wanted everything to go easy, so I turned the burner to high so that it would warm a lot. I then took my hops pellets and placed them in the mesh bag.

Everything was going according to The Book. I swelled with pride — then I noticed the can of malt extract syrup, now an interesting shade of red and swelling, too.

I've got one of those 1-800 legal beagles working on the case, so on his advice I cannot go into much depth. Suffice to say that before you warm up your malt syrup, open the lid with a can opener *even if The Book doesn't say to*! I think that if the medieval castle dwellers had poured boiling malt extract syrup instead of oil down on their enemies, the crusades would have come to a quick conclusion. Believe me, I know of what I speak, and by the way don't change the oil of your car immediately upon returning from a trip to Florida, either.

I managed to save three-fourths of the can and, pinching it between

the hot-dog tongs and a utensil only my wife knows the name of, managed to pour it into the now boiling water. Immediately a wonderful smell filled the kitchen, almost overpowering the odor of burned hair. My confidence and the feeling in my left big toe (I'd dropped the can) returned.

The recipe indicated that I add the dried malt extract powder next. It came in a double-wrapped plastic bag. It would be easy to pour into the pot after untwisting the twist tie. I did so, poised the bag over my wort-to-be (which had now returned to a rolling boil), and overturned it.

There are those who claim experience is the best teacher. Well, I want to speak from experience: Don't believe it.

Apparently malt extract powder, unlike the gunpowder I was familiar with, really is a powder and enjoys all the same properties that any well-hackled trout fly enjoys. It floats. Worse than that, when it hits hot water it sticks together, forming a solid base upon which the remaining powder may rest, except for that portion of the powder that rises on the air currents, covering the stove, kitchen, and any open wounds. I suddenly had a two-pound pyramid of malt powder riding a turbulent and extremely tropical sea.

The sight made me breathe in sharply. Nothing like compounding a problem. I coughed on the malt powder, causing more to leave the pyramid and take flight. The Book never covered this. I turned away to catch a breath of air for a moment. That's when something The Book did mention decided to take place. The Book had warned that there would be a sudden rise of foam after the malt extracts had boiled a bit and to be careful or a small mess might develop. Understatement, pure and simple.

My attention was drawn back to the fiasco on the stove when my brain accepted a message from my feet: They were getting wet, it wasn't raining, and hey, we're inside. Through my watering eyes, my malt pyramid had now taken on the look and attitude of Krakatoa, a sight made all the more impressive by the way the malt powder would spark and flare as it touched the flame of the burner beneath the pot as it rode the malten lava flow down the side of the stove to coagulate at my feet. Things were rapidly getting out of hand. That made me think of my ammo-reloading buddy, Lefty, and I knew then what I had to do. I turned off the gas.

Instantly the turbulent sea subsided, and the malt volcano settled like the Lusitania after a couple of torpedoes in her gut. I picked up the spoon and attempted to push the malt mess down into the pot, the result of which was to displace even more of the muck out of the pot and onto the stove. The cooling malt solution, apparently kin to polyurethane, was self-leveling and rapidly covered the general area. The Blob could have learned from this stuff.

Even I could see that an

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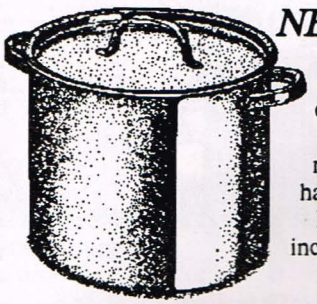
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immediate clean-up was required. This job was way too big for any roll of paper towels, no matter how big the biceps on the wrapper. I tried to move toward the closet to retrieve the mop and bucket, only to discover that boiled-over malt muck has yet another property: It sticks. It makes Crazy Glue look like kindergarten paste. If the secret got out, barnacles would be out of work. My feet were encased. I leaned over as far as I could and was finally able to reach the utensil drawer, from which I was able to extract (yeah, I know) a spatula. Once freed, I set about straightening up.

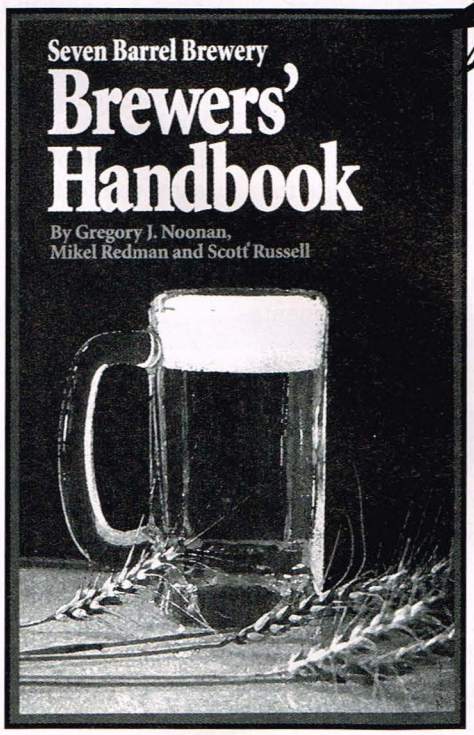
A solid 45 minutes later and the kitchen was recognizable, except that the formerly white stove was now a lovely beige (I hardly needed the spatula/trowel at all — the stuff really is self-leveling). I was back in business.

I turned the heat back on, stirring the inactive maltcano gently around the pot until it dissolved, then set the heat for a slow boil and placed the mesh bag containing the hops pellets into — dare I say it — the wort. The hops actually did what they were supposed to — they dissolved, filling the mesh bag to half its volume and permeating the room with a pungent smell. I turned on the exhaust fan. This stuff smelled strong and would be doing so for at least an hour. I used the time to finish repairing the damage to the kitchen and to read through The Book a fourth time. Carefully. There were no more troubles.

After the hour had passed, I pulled the hops bag out of the boiling wort, let it go, then fished it out again with the hot-dog tongs while holding my other hand under cold, running water. I put the aromatic (sometimes called finishing, or in my case finishing off) hops into the bag and returned it to the wort, which cheerfully accepted it and sent a good-natured splop of liquid in my direction. I easily avoided it as I was now used to my first wort's idiosyncrasies. The timer chimed five minutes. It was time to finish the deed.

I turned off the burner. I brought the water-filled fermentation vessel over to the stove and placed the protective lid on the counter. I then removed the hops bag from the pot (with the tongs; Lefty smiles benevolently somewhere), noting with satisfaction that a minimum of residue remained in the wort. This residue would settle out with the yeast after fermentation, The Book reassured.

I slipped on the hot mitts and attempted to lift the pot to pour the wort into the fermenter, but the malt muck had melded it to the burner of the stove. I mean meld, as in the Vulcan Mind Meld. These two pieces of metal had become a single encrusted entity. Only after applying 170 pounds of torque, and the assistance of my largest block and tackle, was I able to return this entity back to its former schizophrenic state. Back to two separate and distinct personalities: the stove, which had always hated me, and the wort, which had



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CIRCLE 29 ON READER SERVICE CARD

just begun to do so.

I lifted the pot and poured its contents into the fermenter without further ado. I stirred it gently, then removed a small sample with a sanitized measuring cup. This immediately went into the hydrometer testing tube, and my favorite new toy indicated my first wort enjoyed an initial (prior to fermentation) specific gravity of 1.040. Good enough.

I placed an inch of water in the fermentation lock and secured it to the lid of the fermenter, laying the lid on top of the bucket again. All that was left to do was to wait for the wort to cool sufficiently to add the yeast. While waiting, I cleaned up the utensils by putting a gallon of hot water into the boiling pot with a squeeze of detergent. After washing them I went to work on the encrusted sides of the pot itself. I couldn't help but note the malty smell the dishwater exuded, and on a whim I found it had specific gravity of 1.020. I briefly considered experimenting with an open fermentation, then decided to leave well enough alone as it was time to pitch the yeast into the wort.

It was simplicity itself to tear the foil packet of yeast open, and then, as I had just cleaned the kitchen floor, it was simplicity itself to sweep up all the yeast except what rolled under the refrigerator. Kneeling in front of the fermenter, I removed the cover and there, in the middle of the kitchen floor, on my knees, I methodically sprinkled the yeast from the dustpan over the entire surface of the wort while chanting every beer jingle I could remember. Backwards. I then placed the lid on top of the bucket, snapping it down tight to effectively close off the fermentation process to outside contaminants. Snapping the lid down sent bubbles up and out the fermentation lock, and I found that sight comforting. At that moment, apparently believing it was safe to come out, my wife decided to enter the kitchen.

As my back was turned to the kitchen entrance, the only warning I had of impending doom was a blood-curdling shriek as she launched herself toward me. I rose and turned toward her, keeping my body between her onslaught and the vulnerable wort in the fermenter. She hit me head on, and I wrapped my arms around her even as she bear-hugged me in an apparent attempt to drive my ribs into various necessary internal organs. My brain brought my Excuse Synapses on-line with the last of the oxygen-rich blood coming its way. I was fading to black when suddenly she released me from the death clutch and pushed back. Her face loomed up into focus, and she was smiling!

"Oh honey!" she gushed, "You put in a new stove! And such a lovely shade of yellow! No wonder you wanted me and the kids out of the way. I'm so lucky to have a do-it-yourselfer around the house!" I was at a loss for words. I smiled, picked up the fermenter, and got out of there.

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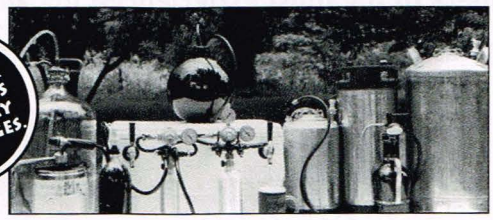
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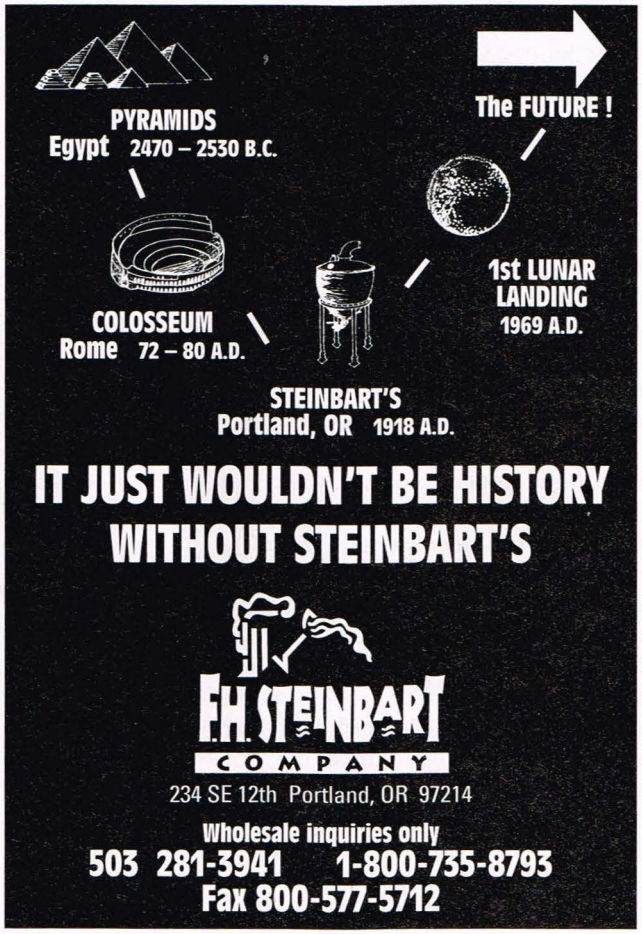
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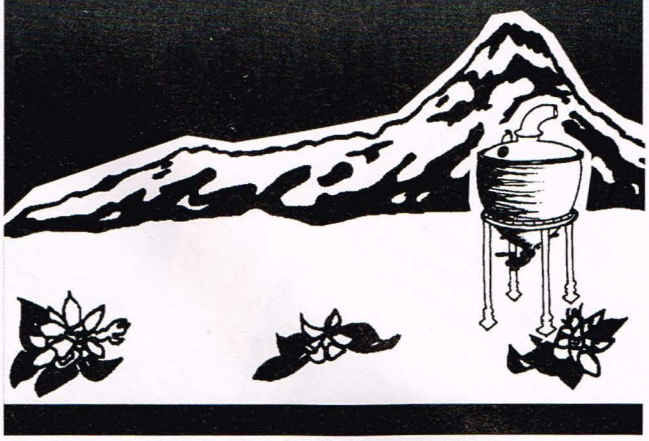
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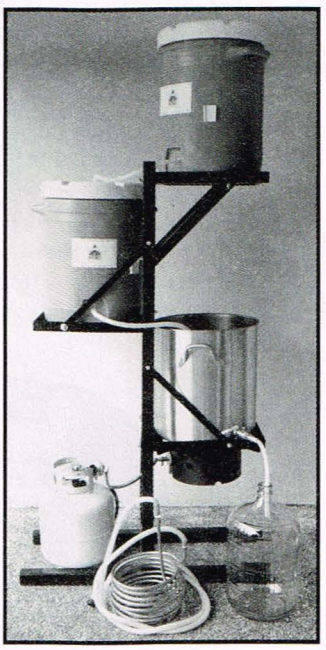
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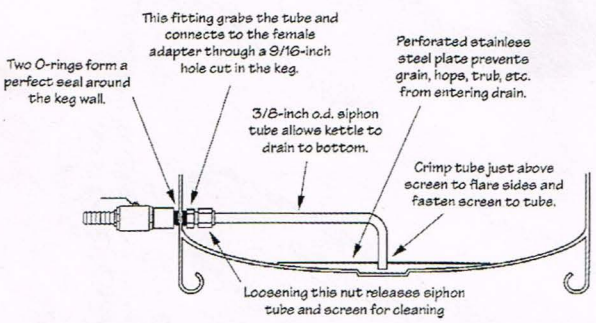
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BUD PEEN

Create Your Own Perfect Porter

by Tom Fuller

Do you remember the movie "Johnny Dangerously"? Johnny walks into his mother's apartment and asks, "Whatcha cookin' Ma?" His mother says "Beer." Johnny replies, "With noodles, good idea." This seemed funny at the time, but as I designed my own recipes over the years, the line took on a new significance. It grew into a philosophy regarding the nature of beer making.

Think, for a moment, of beer as fermented barley soup and your recipes as basic beer "stocks." In the art of soup making, there are four stock bases: chicken, beef, vegetable, and fish or seafood. Most soups are made of these.

In the world of ale, one could argue, there are also four basic stocks (bases): pale, porter, stout, and wheat. Thousands of beers can be made with virtually the same base simply by adjusting the specialty grains, changing the hop profile or mash profile, or using a different yeast strain. Beyond that there's a world of spices, fruits, and other ingredients that can be used to flavor your stock.

Porter Soup

The mighty porter is a particularly interesting stock. Traditionally porter is very dark — almost black — and very bitter. It was first brewed in the early 1700s and became popular with the porters who worked in London, hence the name. The popularity of porter in the United Kingdom declined 40 years ago, but the beer has been propelled into the US mainstream largely by homebrewers, along with the US microbrewing industry.

Porter should have a full-bodied, malty flavor that comes from roasted and caramel malts combined with some of the flavor and dextrins (unfermentable) from the pale malt. Porter should also have a reasonable alcohol content to give it warmth and balance (1.052 to 1.060 specific gravity). It should have a slight estery (fruity) flavor, a smooth,

coffee-like roasted malt taste, and the chocolaty flavor of chocolate malt.

The hopping rate should be fairly high to balance the estery sweetness and acidic quality (30 to 50 International Bitterness Units). In my opinion, well-made porter ranks among the best-tasting beers. The trick is getting the balance right. All flavors should contribute to the beer, with no one flavor dominating the others. Chew on some malts and you'll see where some of these flavors originate.

Favorite Porter
(5 gallons, all-grain)

A very basic porter would look something like this:

Malt:
- 6.6 lbs. pale malt extract
- 5 oz. chocolate malt
- 0.5 lb. caramel malt

Hops:
- 2 oz. Fuggle hops (boil)
- 0.5 oz. Goldings hops (finish)

This is a basic porter, but is it a perfect porter? The "perfect" porter is the one you most enjoy, not the one that just happened to win first place at the last Great American Beer Festival. You need to find one you like and use it as a base.

This is my favorite porter recipe; adjust it to match your taste.

Ingredients:
- 6 lbs. 2-row malt
- 0.25 lb. black malt
- 0.50 lb. roasted malt
- 10 oz. chocolate malt
- 0.75 lb. caramel malt, 40° Lovibond
- 0.75 lb. dextrin
- 2.1 oz. Northern Brewer hops (8.5% alpha acid), 1.5 oz. for 60 min., 0.6 oz. at end of boil
- Fruity ale yeast (Wyeast 1098)

Step by Step:

Mash malts and dextrin at 155° F for one hour. Sparge with 6 gals. of water. Add 1.5 oz. hops and boil for 60 minutes. Turn off the heat and add 0.6 oz. hops. Cool, pitch the yeast, and ferment at 63° F for seven to 10 days. Bottle or keg as usual.

Variation:

Here's an extract version of the same recipe. It also makes five gallons.

Ingredients:
- 6.6 lbs. liquid malt extract (light)
- 6 oz. black malt
- 10 oz. roasted malt
- 14 oz. chocolate malt
- 1 lb. caramel malt, 40° Lovibond

Step by Step:

Steep the grains at 150° to 155° F for 30 minutes. Remove the grain bag, add extract, and boil 60 minutes, adding hops as in recipe above.

This recipe makes a porter with a nice balance of roast and chocolate with a little sweetness. It contains fairly large amounts of black, roast, caramel, and chocolate malts. I chose this grain bill because it matched my personal preference. If I chose to make a more round, sweet, and chocolate porter, I would then increase the chocolate by four or five ounces and the caramel to a full pound (in the all-grain version).

The dextrin is used to increase the body. Dextrin is not used in the extract recipe because it must be mashed to do its job. Remember that chocolate, black, and roasted malt have no enzymes. This means that they do not have to be mashed to provide benefits. Many porters contain no roast or black at all. Deleting these additions would make a very chocolaty porter.

Let the Experiments Begin

For the next step, you have many options to make your porter unique. Spices are a great addition to porters. However, I don't think porters lend themselves well to fruit. Stout and fruit are a much better match, although I have had some tasty raspberry porters.



Microbrewing pioneer Bert Grant made a perfect porter. You can make one to match your taste, too.

Let's say that you would like to make a maple porter, with the maple evident in the aroma as well as the flavor. The first thing to do is take away the finishing hops. You need the bitterness of the boiling hops to offset the sweetness of the maple, yet you don't need the finishing hops blocking the maple aroma. Use your maple instead of the finishing hop. Add about 16 ounces of maple syrup at the end of the boil and allow it to sit for 10 minutes before you chill the beer. Much of the maple aroma will be retained.

My local homebrew club sponsored a Christmas beer competition in which each entry was required to include 50 ingredients. Yeast, water, and salts or finings could not be counted. The interesting thing was that most of the beers entered were based on a porter, and a good bulk of the ingredients were spices.

Here are some spices that lend themselves to porter. Where possible, amounts are listed. Spice use varies greatly based upon the region where the spice is grown as well as the brand and age of the herb or spice.

Anise (licorice) - Adds a nice subtle flavor or a big kick to a beer depending on use. It's best to use brewer's licorice sticks. Use about a quarter of a stick for five gallons or two to three ounces of star anise. It is nice in finishing with a spicy hop.

Bayberry (Myrtle) - Leafy flavors.

Bay leaf - Good flavor enhancer. Good in combination with other spices. Use two to four leaves for five gallons.

Black pepper - Very nice in a roasty porter; turns it into a tenderloin. Use about two tablespoons.

Cassia - Cinnamon-type flavor (used in

Dentyne gum). One to three tablespoons. Complements chocolate.

Cinnamon - Nice if used subtly, no more than three tablespoons.

Cocoa - Great! Try to find the powder with the lowest oil content. You can use a lot of this; it will not hurt.

Coffee - Very nice. Good to use as a last hop strike. Use coarsely ground. Remember, it is also bitter. One pound adds a fairly firm flavor and aroma.

Fenugreek - Used as a base of artificial maple flavor. This is also bitter. Good for maple porter. Use as a middle hop strike in small amounts.

Five-spice - Star anise, fennel, pepper, cloves, and cinnamon. Keep at less than 3 tablespoons.

Frangelico - Hazelnut liqueur.

Ginger - Great with hot peppers or five-spice. Two ounces of fresh, grated root is very noticeable.

Heather - Very aromatic.

Honey - A sweet liquid from the nectar of flowers.

Horehound - A bitter Passover herb.

Hot pepper - Nice in higher-gravity porters. It can range from mild to hot.

Lavender - Highly aromatic and bitter. A tablespoon at the end of the boil is nice.

Molasses - Rich and buttery. Up to one cup per five gallons is a nice, noticeable addition. Blackstrap contains about 65 percent less sucrose yet is much more aromatic.

Mint - A liquid thin mint. Two ounces of mint leaf is a good start.

Orange blossom/Orange peel - Nice in chocolate porters.

Raspberry - Makes a nice dessert beer. A quart in the secondary will add a nice touch.

Of course this is barely skimming the surface. Your imagination can yield a wealth of ideas. Just think about the kind of things that you like to combine together: chocolate on vanilla ice cream, hot peppers in teriyaki...

I prefer to use the spices in the boil, generally as late additions for aroma or middle additions for flavor. Another way to add spices, called the potion method, is preferred by ace homebrewer Randy Mosher, author of *The Brewer's Companion*. This involves mixing the spices in vodka and adding them at bottling. Put about four ounces of vodka into a baby-food jar, mason jar, or other small container, and add spices. Taste the mixture to see that the potion is pleasing, and let it set for a week or so to blend. You will want to taste it again, because the profile will change when the spices marry. Use an eyedropper to add the potion to a sample until the desired effect is achieved.

Chocolate Porter
(5 gallons, all-grain)

Here is a chocolate porter. This recipe came about before I had come up with my favorite porter base, although this is still a nice recipe.

Ingredients:

- 5 lbs. dry malt extract
- 1 lb. caramel malt, 40° Lovibond
- 0.25 lb. black malt

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- 0.25 lb. roasted malt
- 0.25 lb. chocolate malt
- 0.25 lb. confectioner's sugar
- 0.25 lb. corn sugar
- 1.5 cups blackstrap molasses
- 2 oz. grated ginger root
- 8 oz. baker's chocolate
- 1/8 tsp. five-spice
- 1 large cayenne pepper
- 0.5 oz. Kent Goldings hops (5% alpha) for 60 min.
- 1 oz. Willamette hops (5.5% alpha) for 60 min.
- 2 packages dry ale yeast in 1-qt. starter.

Step by Step:

Steep grains at 150° F for 35 min. Remove straining bag, then add extract. Add the rest of the ingredients and boil one hour. I use no finishing hops except maybe a pinch or two of five-spice. Cool and pitch yeast. Ferment for 17 days. For a nice final touch, add a drop of cayenne pepper to every bottle. It's best to use 750 ml bottles if you choose to do this.

Coffee Porter
(5 gallons, all-grain)

This recipe uses the "Favorite Porter" recipe as a base. Because you are adding coffee, which will add some bitterness, reduce the roasted malt to 0.25 lb. and increase the chocolate to 12 oz. to get a nice chocolaty flavor. The coffee will not add so much bitterness that the first hop strike needs to be changed. But skip the last hop strike altogether to allow the coffee to be the dominant aroma.

The recipe steps are the same, except the final hop addition is eliminated. Add 1 lb. of coarsely ground coffee at the end of the boil in a muslin bag (a grain bag or even a nylon stocking) and allow it to steep for 10 minutes.

Christmas Porter
(5 gallons, partial mash)

Ingredients:

- 6.6 lbs. light malt extract
- 3 oz. black malt
- 14 oz. chocolate malt
- 1 lb. caramel malt
- 1.5 oz. Northern Brewer hops (8.5% alpha acid), 1 oz. for 60 min., 0.5 oz. at end of boil
- 1 oz. grated ginger root, for 60 min.
- 1 oz. mint leaves (if whole, use in boil; if ground, use as mid-boil addition)
- 2 tbls. five-spice, at end of boil
- Liquid dry-ale yeast (Wyeast 1084)

Step by Step:

Steep the grains for 30 minutes and remove. Add the extract. Add 1 oz. hops, grated ginger, and whole mint leaves if used. Boil 30 minutes and add ground mint if used. Boil 30 more minutes and add 0.5 oz. hops and five spice. Cool, pitch yeast, and ferment four to 10 days.

Remember, you are only limited by your imagination or unwillingness to risk the time it takes to brew another batch. Go for it!

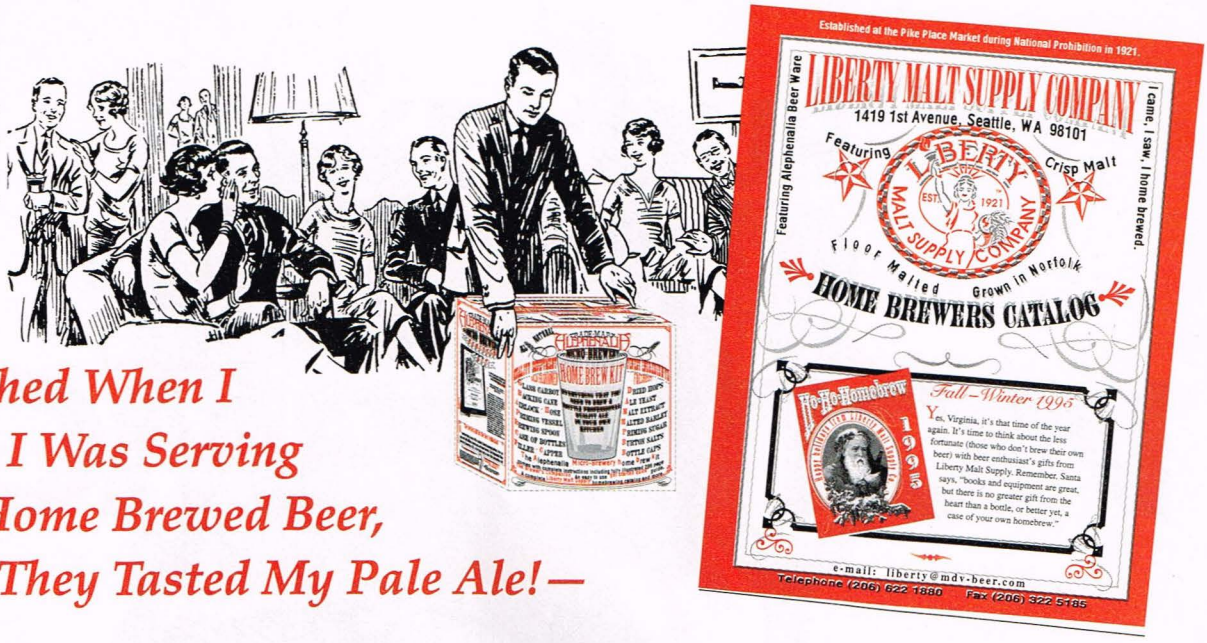


CIRCLE 34 ON READER SERVICE CARD



CIRCLE 33 ON READER SERVICE CARD

"Can it really be any good?" a young woman whispered. "Heavens no," Thomas exclaimed. "He's never brewed a drop in his life."



They Laughed When I Told Them I Was Serving My Own Home Brewed Beer, But When They Tasted My Pale Ale!—

Thomas brought a gift of his latest micro-brew discovery that he wanted everyone to try. I decided that this would be a dramatic moment for me to make my debut. To the amazement of all of my friends, I strode confidently over to my Alephenalia Micro Brewery-Home Brew Kit and began to pull out the professional looking bottles that I had placed there.

"Chuck is up to his old tricks," somebody chuckled. The crowd laughed. They were all certain that I couldn't brew any more than I could make potatoes au gratin.

"Can he really brew?" I heard Thomas' partner whisper. "Heavens, no!" Thomas exclaimed. "He's never brewed a drop in his life. But just you watch him. This is going to be good."

I decided to make the most of the situation. Holding up the wing capper, I explained that I had bottled it just for this occasion. With mock dignity, I drew out a bottle and cradled it in my arms like a great wine. "Is this another of those disappearing ink trips," called a voice from the rear. The crowd rocked with laughter.

Then I began to pour.

Instantly a tense silence fell on the guests. The laughter died on their lips as if by magic. I poured a glass for everyone, even those who exclaimed "I don't like beer." I heard a gasp of amazement. My friends sat breathless, spellbound.

I sampled it myself and for a brief moment I forgot the people around me. I forgot the hour, the place, my fellow imbibers. The little world I lived in seemed to fade—seemed to grow dim—unreal. Only the ale was real. Only the ale and the visions it brought me. Visions as beautiful and as changing as an autumn sunset, with its amber hues, just like my homebrew.

A real Triumph!

As everyone finished tasting, the room resounded with accolades. I found myself surrounded by excited faces. How my friends carried on! Men shook my hand—wildly congratulating me—pounding me on the back in their enthusiasm! Everybody was exclaiming with delight, plying me with rapid questions. Chuck! Why didn't you tell us you could brew like that? Where did you learn? How long have you been brewing?

"I simply followed the complete instructions included with the Alephenalia Homebrew kit," I replied. "And just a short while ago, I didn't know hops from malt."

"Quit your kidding," laughed Thomas, a real beer enthusiast. "You've been brewing for years. I can tell."

"Only since Rosie gave me an Alephenalia Microbrewery for my birthday, less than three weeks ago. I decided to keep it a secret so that I could surprise all you folks." Then I told them the whole story. "Ever heard of **Liberty Malt Supply Company**?" A few of my friends nodded. "That's a home brew shop and mail order catalog!" One of the oldest in the entire country!

"Exactly," I replied. "They have a great program for learning how to brew beers like a professional, the Liberty Way."

How I learned to brew without a teacher.

And then I explained how for years I had longed to brew my own beer. I shared that dream with Rosie and when she saw the Alephenalia Microbrewery in the Liberty catalog, she knew it was the perfect gift for me.

A Complete Catalog!

Pointing to the colorful Alephenalia Micro-brewery carton, I explained, "It contains brewing equipment that can be used over and over to brew beers like the professionals." I told them how pleased I was with *The Brewer's Companion,* a real home brewers bible. The Liberty Pack included with the microbrewery contained enough pre-measured, concisely labeled ingredients to brew five gallons of the Pale Ale. I explained that each of the Liberty packs used the highest quality ingredients, exclusive to Liberty Malt and that packs for each of the classic brewing styles are available.

I proudly told them that I have already begun brewing Weekend Weiss, a Bavarian style wheat beer and Liberator Dopplebock, both promptly received by simply dialing Liberty Malt's own toll free number, 1-800-990-MALT (6258).

Favorite brewing styles

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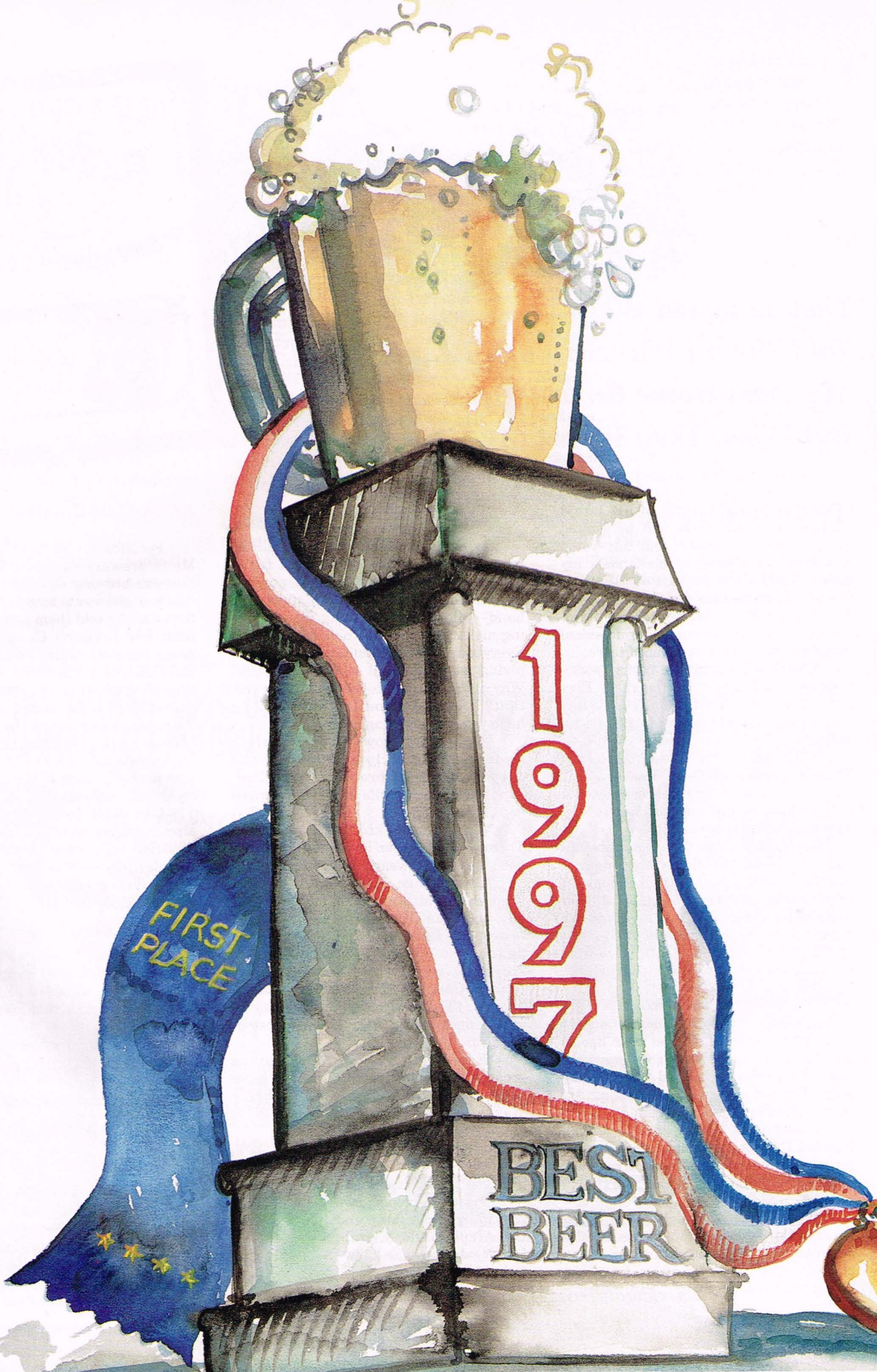
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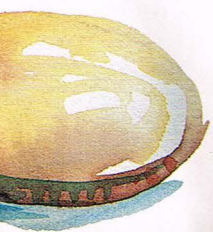
Tips from hopping to shipping rates that will put your beer in the winner's circle.

by Ron Bach

There are several reasons to enter your beer in competition. Entering a homebrew competition is the best way to evaluate the quality of your beer and to receive detailed information on improving your beer and correcting any faults it might have.

Another reason to enter contests is the spirit of competing — pitting your beer against others and finding out how well it measures up. There is great excitement in competing and an immense pride in winning, in knowing yours was one of the best beers entered.





Some homebrewers brew only for the thrill, excitement, and challenge of competing. One award-winning Texas homebrewer said, "I got into homebrewing only to compete. I do not brew to drink my own beer. I am a very competitive person, I've competed athletically all my life, and now I find competing in homebrew competitions helps fill that void."

Doing some basic groundwork before you enter is necessary to give your beers a fighting chance.

Before You Brew

There are many factors to take into account when brewing for competition. It is important to know the rules and guidelines of the competition you plan to enter. Most competitions have fairly standard rules with some unique guidelines. If you don't follow these rules, you may find yourself disqualified and all your work for naught.

One competition may allow only 12-ounce brown bottles while another competition may adhere to the American Homebrewers Association (AHA) competition standards of 10- to 14-ounce green or brown unmarked bottles. Some competitions allow multiple entries in a category while others permit only one entry per category. Most competitions require three bottles to enter, but some smaller competitions request only two bottles per entry. Regardless, you must review the competition rules and follow them.

Another critical area to research is the styles guidelines for the competition. The majority of competitions follow the AHA styles guidelines with some minor deviations, such as establishing a unique category for the competition.

The Dixie Cup in Houston is perhaps the largest homebrew club competition in the United States with 981 entries in the October 1996 competition. The Dixie Cup has its own styles guidelines. Three of the unique categories include "East Coast Porter," less hoppy and assertive than traditional porter; "California Dark Texas Brown Ale," a category for homebrew that has no commercial equivalent and that does not quite fit into any other category; and "Breakfast Cereal Beer" (first created by the Chicago Beer Society in the Midwest Invitational Brewoff), which requires at least one multi-serving container of a breakfast cereal to be used as a source of fermentables.

Pay attention to detail when brewing. Keep a close eye on developing the correct original gravity, final gravity, and color of the beer for the style.

Brewing the Best Beer

Whether you are a beginning brewer or an experienced brewer, an all-extract, a partial-mash, or an all-grain brewer, do not hesitate to compete. Brewers in all of these areas have been successful in competitions.

All-grain brewers do have a clear advantage when brewing the light-colored lagers, such as American lagers, classic pilsners, and German light lagers, since it is very difficult to keep the color in the light straw to golden range (2° to 8° Lovibond) using extract malt. Partial-mash brewers can compete nose to nose with all-grain brewers, especially when brewing ales.

The key to brewing for competition is disciplined brewing: brewing to style and adhering to guidelines. When brewing a beer for competition, first determine the style you want to brew. If it is a style you have not brewed before, you will need to do some research to acquaint yourself with the style, its various characteristics, and its parameters. You may find recipes in brewing magazines, in books on brewing and beer recipes, from other homebrewers, and from your local homebrew supply shop. When you are familiar with a style, try developing your own recipes.

Pay attention to detail when brewing. Keep a close eye on developing the correct original gravity, final gravity, and color of the beer for the style. Carefully choose the variety of hops, grains, water treatment, and yeast strain to give the beer the proper characteristics.

You need to establish a realistic time line, carefully planning out when you should finish brewing and bottling each beer you plan to enter in a given competition. It is imperative to start early and to brew the stronger, higher-alcohol beers first so they can mature. Some beers, such as barleywines, strong ales, and doppelbocks, can take six months to a year or more to peak, while other styles, such as pale ales and bitters, usually peak in freshness after three to six weeks in the bottle. The stronger beers and darker beers last longer and can be entered in multiple competitions. You are not restricted to entering one of your beers in only one competition.

You will want to taste and evaluate your beers before you enter them into a competition. By periodically tasting your beers, you will be able to ascertain how well your beers are developing and maturing. Ask others knowledgeable about the style to sample your beer and tell you how well it fits the category you plan to enter and if it has any faults. It is not unusual for a beer to turn out different than intended and have characteristics more closely fitting another subcategory or style.



A few years ago one brewer entered a beer in two categories in the same competition and took a second place as an India pale ale and third place as an English old ale. Later the same year that beer was selected the best Scottish ale in the brewer's homebrew club and was entered into the AHA Scottish Ale Club Only Competition. Although not in the top three Scottish ales, it placed number two out of eight in the Scottish heavy ales subcategory. This would be much harder to do today, because the quality of the beers entered in competition is much better and the judging has improved markedly. Still, you can sometimes get a lot of mileage out of one beer.

Entering the Competition

You need to be discriminating about the competitions you enter. Select only the ones that best suit your goals. In 1996 there were more than 200 competitions across the United States. Why ship your beers all the way across country when there may be local events that will do just as well?

Check out local competitions such as a local homebrew-club event or a nearby state fair. If you are just starting to compete and your primary goal is to win rather than obtain feedback on your beer, stay away from the large competitions (200 entries or more) and enter the smaller events. For the best opportunity to compete, place, and sharpen your brewing skills, enter multiple competitions and submit multiple entries. In the larger homebrew contests the judges are generally more experienced, but the overall caliber of the entries is much higher. Once you have established yourself in smaller competitions, then enter the larger, more challenging events.

Competition schedules are available in regional brew newspapers. Another source is homebrew clubs. The AHA sends out quarterly updates to affiliated clubs listing AHA-sanctioned competitions scheduled for the next six to nine months.

When it's time to send your beer off to the chosen site, careful packing is important to ensure your entries arrive in good condition. A broken bottle can eliminate you from the possibility of first place or best of show. A good source of shipping boxes is from beer-of-the-month clubs. They usually hold 12 bottles (four entries). Do not rely on the boxes themselves. Add additional packing such as bubble wrap, popcorn packing, or even fluffed-up newspaper. You can also protect your shipment by packing the box in another larger box with packing all around the inside.

If you are a member of a homebrew club, encourage your club to hold packing parties to help members ship their beer to competition. One homebrew club regularly packs and ships more than 100 entries at its packing parties. Maybe a club member has business connections and can get the UPS business shipping rate, or your local homebrew supply shop might be willing to help you ship your beer at a discount.

Shipping is another area to which many competition entrants do not give adequate attention. Although alcohol cannot be shipped through the US Postal Service, it is legal to ship it through commercial parcel companies, such as UPS and Federal Express, for competition and tasting.

Find out what the shipping time will be, because you want your shipment to arrive in plenty of time to allow the beer to stabilize and settle before being judged. Some shipping outlets are not knowledgeable about the legalities of shipping beer. To avoid problems, be inventive in what you label your shipment. Call it "perishable food products," "liquid bread," or even "specimen samples."

Avoid shipping over weekends, if possible, because the shipment may sit in a hot truck or in a freezing warehouse, ruining your beer. It doesn't take much abuse to affect the flavor and taste of beer. Ship in time to arrive before the weekend, even if it is a week before the competition. The deadline for entries is often as much as five days to a week before competition judging. As a rule, the larger the competition, the earlier the entry deadline. During extreme weather or when you lack

The Shipping Do's

1 Use your best bottles; you want to make a good first impression.

2 Ship the right number of bottles. Most homebrew competitions require three for each entry.

3 Pack well. Use bubble wrap or popcorn packing. Place one box within another if necessary.

4 Don't label your package "beer." Call it "perishable food products" or another generic name.

5 Use a private carrier such as UPS or Federal Express. It's illegal to ship alcoholic beverages through the US Postal Service.





FedEx

6 Don't ship over a weekend. Your package may sit on a hot truck.

shipping time, consider spending a couple of extra dollars to air express your prized competition beer.

The Winning Edge

Brewing good beer and getting it to competition is a great start, but they are just small steps. Here are some hints that could give your beers a winning edge.

Brew the big beer. Big beer is generally at the high end of the scale for the style. Brew a beer that has a high starting gravity and a high hop rate for the style. While you are going for a very flavorful beer, make sure your beers have a good hop/malt ratio and are balanced in both flavor and aroma.

Always use the proper brewing ingredients for the style, including hops, malt, yeast, and water treatment. For example if you are brewing a classic English pale ale, use traditional English hops such as Fuggle or East Kent Goldings. Do not substitute Cascade, which is very citrusy, flowery, and floral in flavor and aroma. If you are brewing a German doppelbock, do not use roasted barley to darken the beer because it is inappropriate for that style (but essential in a dry stout).

Make a good first impression. Get off on the right foot with the judges by selecting your best-looking bottles for competition. Fill them to the proper level, one-half to 1 1/2 inches from the top.

Submit many entries. The more entries you submit, the greater your chances of winning.

Take advantage of regional beer preferences. An awareness of regional beer preferences can help make you more competitive when entering beer in these areas. For instance the West Coast is known for its hoppy ales, so make sure your ales are very hoppy for those competitions. The central part of the country, including Texas, has a strong German brewing influence that tends to emphasize less-hoppy styles of lagers. The Northeast, with its strong English influence, leans toward English styles, particularly the heavy ales such as English old ales, Scottish strong ale, and barleywine. In Florida they brew ales with a lot of hop character.

Do not get discouraged. It is extremely important to maintain a positive attitude when entering competitions. You will receive impartial evaluations of your beer, and as your brewing improves through experience and feedback, you will eventually start to win. Remember, winning in competition is to some extent a numbers game. If you are brewing clean, relatively faultless beer, you will eventually win. Also, just because you win in one competition, even if you win best of show, you may not win in another competition with the same beer. There are many variables that come into play including the quality of the other beers entered, the freshness of your beer, the experience of the judges, the size of the competition, and regional differences.

Ron Bach is an award-winning homebrewer, a BJCP Certified Judge, and a veteran competition organizer.

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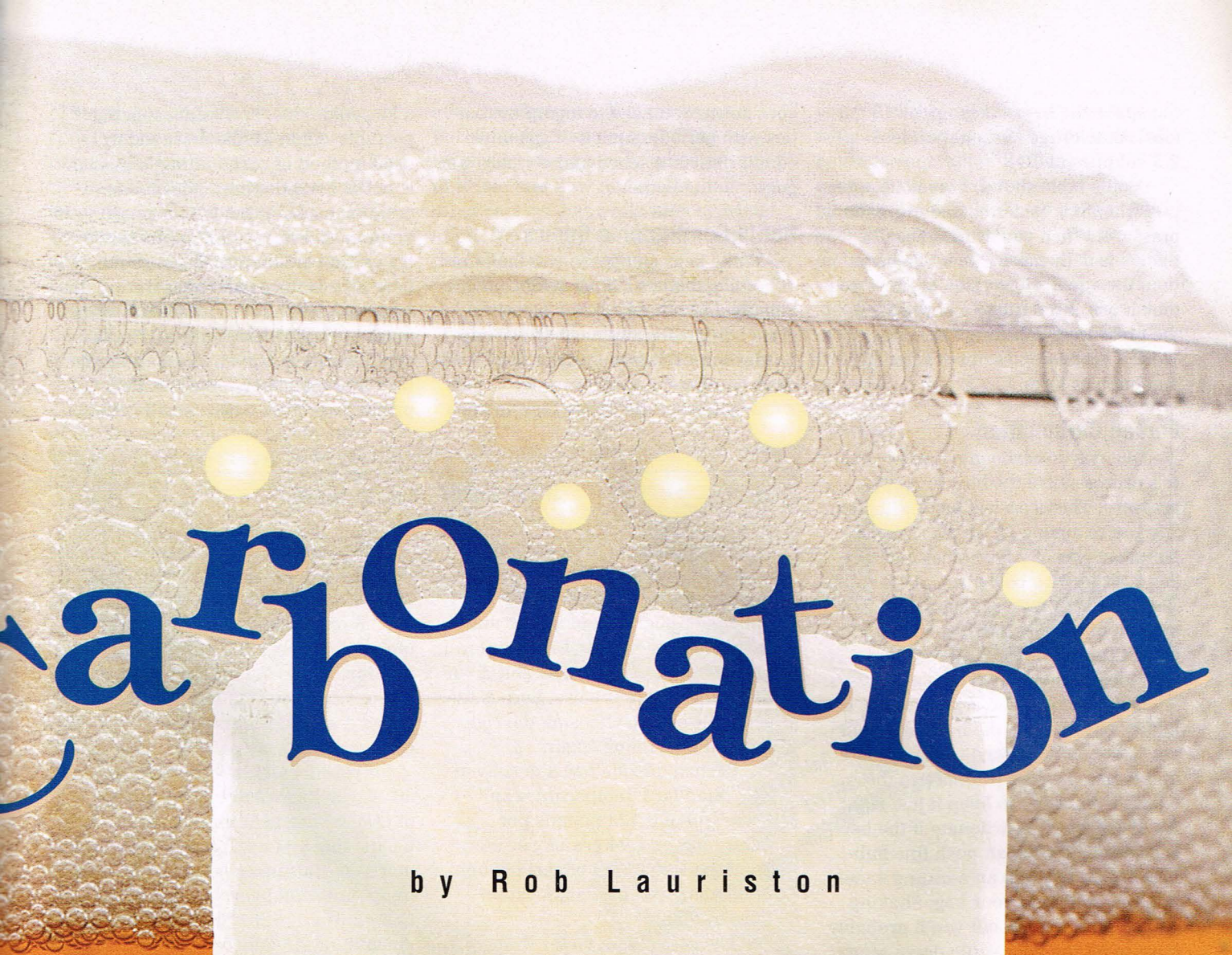
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arbonation

by Rob Lauriston

Under-carbonated beer is not called "flat" for nothing! You want your beer to sparkle, but without carbonation it tastes thin, watery, dull, and lifeless. It's hardly beer unless you can feel the bubbles dancing on your tongue. Perhaps it has the slow, graceful, waltzing tingle of a brown ale or the hyperactive, cleated tap-dance of an effervescent wheat beer, but bubbles there must be.

You want carbonation, but how to get it? Your fermented wort is full of wonderful head-building proteins, but the airlock is idle. You've got to get the gas into the beer and pump up those bubbles, but how?

Introducing the equilibrium table. Carbon dioxide (CO_2) is the gas produced by fermentation that makes your beer bubble. The table on pages 50 and 51 tells you how much CO_2 will be in your beer at equilibrium (the point at which CO_2 can no longer be absorbed) for a given pressure and temperature. The amount of CO_2 is given in "volumes." A volume is the space that the CO_2 would take up at a pressure of one atmosphere (about 15 pounds per square inch) and at a temperature of 0° C (32° F) — that's Standard Temperature and Pressure (STP). In other words, if five gallons of beer contained three volumes of CO_2, the CO_2 by itself would occupy three times

the space the beer takes up, or 15 gallons. An average carbonation level is 2.5 volumes of CO_2.

As the table shows, beer holds more CO_2 when it is cooler or under greater pressure. When you drink a beer, there's usually more CO_2 in the beer than the equilibrium value because you took it out of the fridge and released the pressure by opening the bottle. Violà! The gas comes out of solution and bubbles form.

Forced Carbonation

One way to carbonate is to reverse this process: Cool the beer and apply pressure. This is easiest to do with kegs. Say you're aiming for an average carbonation level of 2.5 volumes and the keg is sitting in a cool place at 45° C. The table says that you'll get that amount of carbonation if you keep 15 psi of CO_2 on the beer. This carbonating with top pressure could take a few days.

One way to speed it up is to put a higher pressure on the beer until you get close to the desired carbonation and then lower the pressure to the equilibrium value to keep it just right. It's also easier to carbonate if the beer is colder or if you can push fine bubbles of CO_2 through an aerating stone into the bottom of your keg. Shaking can help to a point, but you'll probably have to let the beer settle down afterward. You can leave your CO_2 line hooked up to your keg, but as insurance against leaks, you might want to top up the pressure periodically and disconnect the gas each time.

If you've been dreaming of a draft system for years but Santa hasn't delivered, you can still use top pressure to carbonate. You need special reusable caps with a fitting to connect to a CO_2 line and bottles that will accept those caps. These caps are commercially available. You can also build your own by finding some tire valves that you can clean and sanitize and installing them in some caps. Either way, you're likely restricted to using bottles, such as PETs, that will accept screw caps.

Using this method you'd want to give each bottle a shot of gas, then open it a crack to try to purge the headspace of air, then apply an initial dose of gas above equilibrium. As the CO_2 dissolves into the beer, the headspace pressure goes down. You need to top up the bottles with periodic squirts of gas until equilibrium is reached and no more gas goes into the bottle.

Bottle Conditioning Basics

While kegs can spare you the effort of bottling, bottles still have advantages. Some people simply prefer beer in a glass bottle with a regular crown cap. Bottles are certainly cheaper than draft equipment, and it's easier to put a few bottles in the fridge than to keep a keg cold. Plus, bottles are more portable. All in all the most widely used method of carbonating homebrew is bottle conditioning. This means creating carbonation with a small amount of fermentation in the bottle. It's called conditioning because the beer also matures and ages during this fermentation, but "conditioning" often means simply "carbonation." Bottle conditioning is done by fermenting the beer out completely until it is flat, priming the beer with a small amount

If You Really Need To Know

Many brewers are perfectly happy to start with the three-quarters-cup-sugar-per-five-gallons-of-beer rule of thumb and then experiment until the right level of carbonation is reached. But if you need to be more precise, here is the scientific side to choosing the right amount of priming sugar.

Carbon dioxide has a density at STP (Standard Temperature and Pressure) of 0.122 pounds per cubic foot, or 1.94 grams per liter. Sometimes the level of carbonation of beer is given by weight rather than by volume.

The conversion factor from volumes to CO_2 by weight is 0.194. For example: 2.5 volumes x 0.194 = 0.485 g/l. To convert to volumes, multiply by 5.147 (the inverse of 1.94).

Carbon dioxide has a molecular weight of 44.01 and glucose has a molecular weight of 180.16. During fermentation each molecule of glucose creates two molecules of ethyl alcohol and two molecules of CO_2. A mole is the number of molecules that has a weight in grams equal to the molecular weight of the molecule. That means that one mole of glucose weighs 180.16 grams and ferments to produce two moles of carbon dioxide weighing 2 x 44.01g = 88.02 g.

Say you want your five gallons (18.93 liters) of beer to have 2.5 volumes of CO_2. That's 18.93 liters x 2.5 volumes = 47.32 liters of CO_2.

Since a mole of CO_2 occupies 22.414 liters (STP), we need 47.32 / 22.414 = 2.11 moles of CO_2. This will be produced by half that many moles of glucose, or 1.056 moles. Multiply by the molecular weight of glucose and you find that you need 190.2 grams of glucose or 6.71 ounces.

If your fermentation ended at 50° F, you might have 1.2 volumes of CO_2 in your beer already. That means that you need 1.3 volumes more CO_2 to end up with 2.5 volumes. You could get that by adding (1.3 / 2.5) x 190.2 = 98.9 grams of glucose, or 3.5 ounces.

You can make similar adjustments if you have a different amount of beer or if you're aiming for a different level of carbonation. If you want to carbonate to 2.8 volumes instead of 2.5, multiply by 2.8 / 2.5. If you have four gallons of beer instead of five, multiply by 4 / 5.

For example if you have 10 gallons of ale that you figure has 0.9 volumes of CO_2 already and you're aiming for 2.0 volumes, you need 1.1 volumes more. You calculate: (190.2 g glucose)(10 gal./ 5 gal.)(1.1 vol./ 2.5 vol.) = 167.4 g glucose (or 5.9 oz.).

When you're adjusting to add more sugar (e.g. more beer), put the big number on top; when you're adjusting for less sugar (e.g. less carbonation) put the smaller number on top.

of sugar, bottling, and then waiting a couple of weeks for the fermentation to take place.

It's hard to be precise about the amount of priming sugar to use. (If you want to get scientific, see the box on page 46.) Many factors affect bottle conditioning, and once you take them into consideration, you'll probably end up back at the tried-and-true formula of one-half to one cup of sugar per five-gallon carboy of beer, depending upon the level of carbonation you're after. Try three-fourths cup to start. The best method of being more precise is to keep notes on how you've carbonated, and keep track of the results. Record temperatures, handling involved in the process, what you used to prime and how much of it, and any other factors that could affect carbonation. Here are some of the factors that affect conditioning:

CO_2 in Flat Beer. Depending upon the temperature of your beer and how much it has been shaken around, you'll have varying amounts of CO_2 in your "flat" beer. The more you start with, the less you need to add with the bottle fermentation. Bottlers often overlook the fact that there is quite a bit of CO_2 in solution in so-called "flat" beer after fermentation. If you fermented at 60° F, you already have one volume of CO_2 in your beer. If you lagered near 32° F, you could have as much as 1.7 volumes of CO_2 — that's two-thirds of the final amount of CO_2

Standard Carbonation Levels

While beer averages around 2.5 volumes of CO_2, there's quite a bit of variation. Beers that are traditionally low in carbonation might be under two volumes, but they will taste flat. Carbonation at three volumes of CO_2 is quite high, but exceptionally spritzy beers could reach up to five volumes of CO_2. Here are some values for the carbonation level of different styles of beer, in volumes of CO_2:

Cask ales and barleywines
1.5 to 2.0 volumes
Draft porters and stouts
1.5 to 2.2
Bottled ales
2.3 to 2.6
European lagers
2.4 to 2.6
North American beer
2.5 to 2.6
Wheat beers
3.0 to 5.0

If you are planning to enter your beer in a competition, you'll be obliged to match your carbonation to the style guideline for the category you've entered. Otherwise, creativity and personal preference are your playing field.



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you're after! This dissolved CO_2 is one reason airlocks might continue to bubble after the fermentation is done. The equilibrium table can be useful when bottle conditioning to let you know how much CO_2 is in your beer before you add the priming sugar.

Agitation. And here's another quirk of carbonation. In addition to temperature and pressure, agitation also affects carbonation. Say you take a bottle of beer to the paint store and coerce its employees into putting the beer on their mixing machine for a few minutes. (Do not try this at home!) Any experienced beer drinker with the slightest presence of mind will not open the bottle right away unless he *wants* a shower with beer shampoo! But if you let the bottle sit and settle down, it will once again be safe to open, even if the temperature and pressure have remained the same. So what happened? CO_2 forms weak inter-molecular attractions with the rest of the solution. When you shake a bottle, these weak bonds are broken and the gas comes out of solution more easily, which is the cause of the beer geyser. When you let it sit, the bonds reform.

Mechanical agitation is one reason bubbles can appear seemingly out of nowhere in your siphon hose. The agitation is knocking residual CO_2 out of the beer. This makes it harder to be sure of the amount of CO_2 in your beer after fermentation because the temperature-pressure equilibrium isn't the only factor at work.

Headspace. Another factor that will affect the level of carbonation in your bottle-conditioned beer is the amount of headspace you allow in the neck of the bottle above the beer. The CO_2 from the bottle fermentation fills the headspace as well as going into the beer, so the more headspace you leave, the more CO_2 ends up there. For a given amount of priming sugar, the greater the headspace, the lower the carbonation.

The ideal fill height is a matter of preference. High fills help to eliminate air from the headspace, helping you avoid oxidation. Lower fill levels give some protection against gushing and allow some leeway in carbonating. Sometimes over-carbonating can be corrected by cooling the beer as much as possible, gently prying the cap to release the pressure in the headspace, and then resealing the cap. This won't work if there is no headspace.

Method of Measurement. When trying to judge the amount of priming sugar to add, measuring the sugar by weight rather than by volume usually gives more accurate results, but it isn't foolproof.

If the priming sugar absorbs moisture from the air, the weight increases, but the amount of sugar stays the same. Using the same weight of sugar then gives varying amounts of carbonation. Dried extract is especially prone to sucking up moisture from the air. Since volume is less affected by moisture pickup, volume might be better for measuring dried extract. And of course, weighing is only as good as the machine used, but you already have a skookum scale for your hops, right?

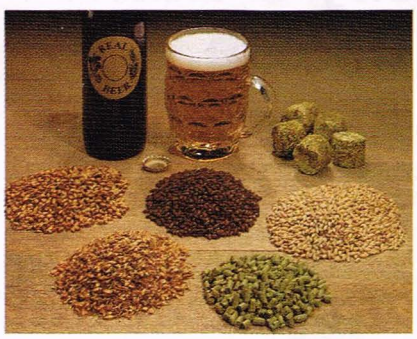
When Sugar Is Not Sugar

What are you going to use to prime? The sugar you use can be a refined sugar such as dextrose, or it can come from dried or liquid malt extract, honey, or even fruit juice. Since dried malt extract is less fermentable than dextrose, you should use more of it. If you figure your extract is 80 percent fermentable, then you'd have to use 25 percent more dried extract than you would sugar (80% x 125% = 1).

Microbrewing and homebrewing often stress the use of natural ingredients. When it comes to carbonation, that means that artificial carbonation using CO_2 from a tank is often looked down upon as inferior to the "natural" carbonation of bottle-conditioning. This is wrong. Carbon dioxide from a tank is probably the purest of any ingredient you can put in your beer and CO_2 is CO_2 no matter where it came from.

Forced carbonation can give different results than bottle conditioning, but the carbonation itself will be the same. For example, any difference in the head that beers form will be the result of differences in the head-building properties of the beers, not in the source of the CO_2. Priming with

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honey might improve the head on your beer, but it will be because of the other ingredients that you added when you added the honey. Fermenting out the honey and carbonating artificially would give the same result. But as always, it's important to feel good about how you make your beer. Bottle conditioning can have some secondary benefits, such as reducing the butterscotch flavor of diacetyl or decreasing the oxygen dissolved in the beer.

Since aromas are often scrubbed out of beer during fermentation, priming offers a good opportunity to add aromatics to your beer. Adding fruit juice at priming would be a great way to get a good nose on a fruit beer, though you might have difficulty determining how much sugar you were adding. An approximate method of determining the sugar content of juice would be to take its specific gravity.

Say you're adding four cups of juice with a gravity of 1.080. The four cups equal one liter, which means that your juice is 80 grams per liter more dense than water. (One liter of water weighs 1,000 grams. Gotta love it!) If you make the big assumption that fermentable sugars are responsible for the difference in density, you know you've got 80 grams of sugar or 2.8 oz.

How To Add the Sugar

You could add a small amount of sugar to each of your bottles and then rack your flat beer into them. But accurately measuring the amount of sugar is harder. It's also harder to eliminate any microbugs from your sugar, and you might even end up with too much foaming when you fill the bottles. This method might still be worth while if, for some reason, you don't know how much beer you're bottling or if you are not bottling the entire batch.

A popular alternative method is to boil your sugar with a cup or so of water and then mix this into the entire batch. The boiling kills any bugs and you measure the sugar only once. Naturally, it is important to have this sugar water well mixed into your beer so each bottle will get the same amount of sugar and end up with the same carbonation.

Since you also want to leave as much of the yeast as possible behind in the fermenter, a good method is to put your prepared priming liquid into a container and then rack your beer into it. As the bottling container fills, the priming sugar should get mixed in quite well. You then siphon your beer into your bottles and cap them.

Kegged or draft beer can also be carbonated by priming. All you really need is a container that will hold pressure.

Carbonation isn't exactly a flavor. It's part of the overall sensation of drinking beer. Along with temperature, carbonation determines how the flavors in your beer will present themselves. Next time you're tasting your homebrew after fermentation, don't be disappointed if it isn't yet all you had hoped for. Reserve judgment until you've added that magical touch of carbonation.

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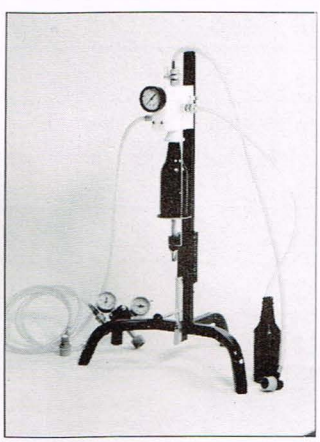
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Carbonation Table

Temperature of Beer (°F.)	Pounds per Square Inch														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
30	1.75	1.82	1.92	2.03	2.14	2.23	2.36	2.48	2.60	2.70	2.82	2.93	3.02		
31	1.73	1.78	1.88	2.00	2.10	2.20	2.31	2.42	2.54	2.65	2.76	2.86	2.96		
32	1.70	1.75	1.85	1.95	2.05	2.16	2.27	2.38	2.48	2.59	2.70	2.80	2.90	3.01	
33	1.68		1.81	1.91	2.01	2.12	2.23	2.33	2.43	2.53	2.63	2.74	2.84	2.96	
34	1.65		1.78	1.86	1.97	2.07	2.18	2.28	2.38	2.48	2.58	2.68	2.79	2.89	3.00
35	1.63			1.83	1.93	2.03	2.14	2.24	2.34	2.43	2.52	2.62	2.73	2.83	2.93
36	1.60			1.79	1.88	1.99	2.09	2.20	2.29	2.39	2.47	2.57	2.67	2.77	2.86
37	1.58				1.84	1.94	2.04	2.15	2.24	2.34	2.42	2.52	2.62	2.72	2.80
38	1.55				1.80	1.90	2.00	2.10	2.20	2.29	2.38	2.47	2.57	2.67	2.75
39	1.53					1.86	1.96	2.05	2.15	2.25	2.34	2.43	2.52	2.61	2.70
40	1.50					1.82	1.92	2.01	2.10	2.20	2.30	2.39	2.47	2.56	2.65
41	1.48						1.87	1.97	2.06	2.16	2.25	2.35	2.43	2.52	2.60
42	1.45						1.83	1.93	2.02	2.12	2.21	2.30	2.39	2.47	2.56
43	1.43						1.80	1.90	1.99	2.08	2.17	2.25	2.34	2.43	2.52
44	1.40							1.86	1.95	2.04	2.13	2.21	2.30	2.39	2.47
45	1.38							1.82	1.91	2.00	2.08	2.17	2.26	2.34	2.42
46	1.35								1.88	1.96	2.04	2.13	2.22	2.30	2.38
47	1.33								1.84	1.92	2.00	2.09	2.18	2.25	2.34
48	1.30								1.80	1.88	1.96	2.05	2.14	2.21	2.30
49	1.28									1.85	1.93	2.01	2.10	2.18	2.25
50	1.25									1.82	1.90	1.98	2.06	2.14	2.21
51	1.23										1.87	1.95	2.02	2.10	2.18
52	1.20										1.84	1.91	1.99	2.06	2.14
53	1.18										1.80	1.88	1.96	2.03	2.10
54	1.15											1.85	1.93	2.00	2.07
55	1.13											1.82	1.89	1.97	2.04
56	1.10												1.86	1.93	2.00
57	1.08												1.83	1.90	1.97
58	1.05												1.80	1.86	1.94
59	1.03													1.83	1.90
60	1.00													1.80	1.87

Carbonation Table

	Pounds per Square Inch															
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
30																
31																
32																
33																
34																
35	3.02															
36	2.96															
37	2.90	3.00														
38	2.85	2.94														
39	2.80	2.89	2.98													
40	2.75	2.84	2.93	3.01												
41	2.70	2.79	2.87	2.96												
42	2.65	2.74	2.82	2.91	3.00											
43	2.60	2.69	2.78	2.86	2.95											
44	2.56	2.64	2.73	2.81	2.90	2.99										
45	2.51	2.60	2.68	2.77	2.85	2.94	3.02									
46	2.47	2.55	2.63	2.72	2.80	2.89	2.98									
47	2.42	2.50	2.59	2.67	2.75	2.84	2.93	3.02								
48	2.38	2.46	2.55	2.62	2.70	2.79	2.87	2.96								
49	2.34	2.42	2.50	2.58	2.66	2.75	2.83	2.91	2.99							
50	2.30	2.38	2.45	2.54	2.62	2.70	2.78	2.86	2.94	3.02						
51	2.25	2.34	2.41	2.49	2.57	2.65	2.73	2.81	2.89	2.97						
52	2.22	2.30	2.37	2.45	2.54	2.61	2.69	2.76	2.84	2.93	3.00					
53	2.18	2.26	2.33	2.41	2.48	2.57	2.64	2.72	2.80	2.88	2.95	3.03				
54	2.15	2.22	2.29	2.37	2.44	2.52	2.60	2.67	2.75	2.83	2.90	2.98				
55	2.11	2.19	2.25	2.33	2.40	2.47	2.55	2.63	2.70	2.78	2.85	2.93	3.01			
56	2.07	2.15	2.21	2.29	2.36	2.43	2.50	2.58	2.65	2.73	2.80	2.88	2.96			
57	2.04	2.11	2.18	2.25	2.33	2.40	2.47	2.54	2.61	2.69	2.76	2.84	2.91	2.99		
58	2.00	2.07	2.14	2.21	2.29	2.36	2.43	2.50	2.57	2.64	2.72	2.80	2.86	2.94	3.01	
59	1.97	2.04	2.11	2.18	2.25	2.32	2.39	2.46	2.53	2.60	2.67	2.75	2.81	2.89	2.96	3.03
60	1.94	2.01	2.08	2.14	2.21	2.28	2.35	2.42	2.49	2.56	2.63	2.70	2.77	2.84	2.91	2.98

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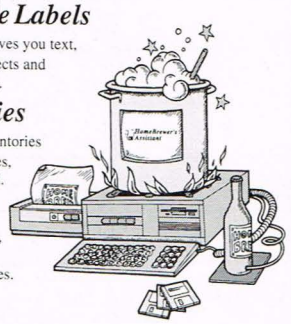
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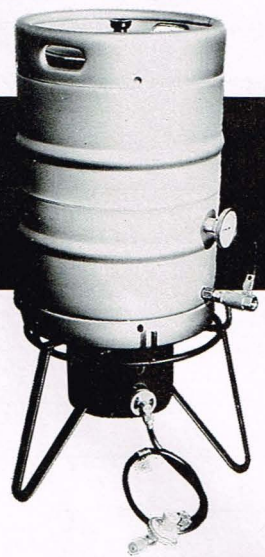
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CIRCLE 45 ON READER SERVICE CARD

Bulk Up Your Sparge Technique

by Sal Emma

Eliminate the need to balance inflow and outflow by sparging with a batch method. It may take the same amount of time as traditional trickle-method sparging, but it requires much less maintenance.

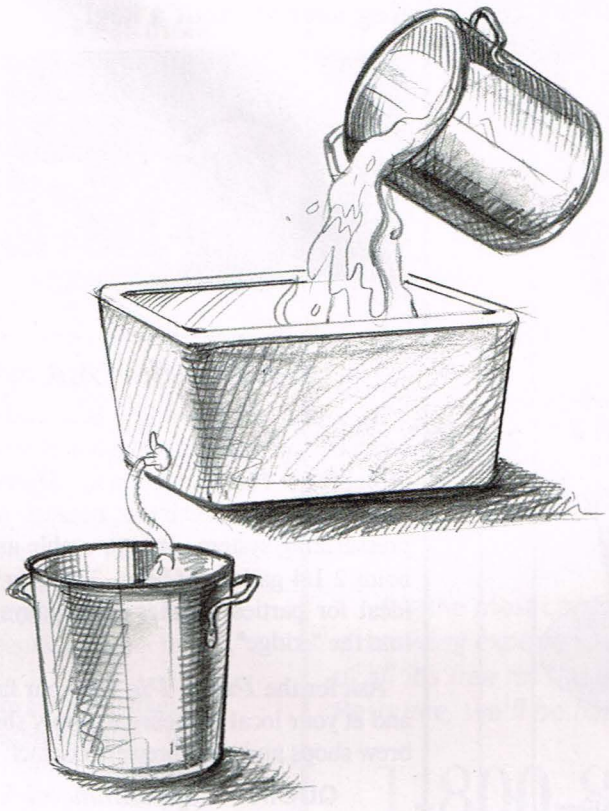
Your mash is mashed and conversion is complete. It's time to sparge. If you sparge by traditional methods, it's a real balancing act. In your efforts to rinse the mashed grains, you have to sprinkle water on top of the grain bed at the exact rate you draw off the wort from the bottom.

It's not always as simple as it sounds. It is difficult to get the balance just right for more than a minute or two. If you let it go for too long, the bed will get too dry or the sparge water will start filling up the mash tun, threatening to overflow onto the floor.

And in the meantime the sparge water, which should be kept at 170° F, cools to a lower, less effective temperature.

There's got to be a better way, right? You guessed right. Hey, if there were no better way, this article would pretty much have come to a grinding halt right here.

It's called batch sparging. Although it takes the same amount of total time to complete the sparge with the batch method and the trickle method, batch sparging needs a heck of a lot less maintenance. In other words you can do other stuff, such as clean up the mash gear and get ready for brewing, have a beer, watch the game, whatever, instead of hovering over the lauter tun like an obsessed mother hen.



KRISTINE BYBEE

A Quick Review

Sparging is the process of rinsing extract out of barley malt that has been mashed. During the mash crushed malt is steeped in hot water over time. Slowly nature's magic activates on-board enzymes to convert starches to fermentable sugar.

You need only a little bit of water to mash, usually around a quart per pound of grain. To get six gallons of wort from, say, six pounds of grain, you have to rinse the grains with hot water, collecting it as you go. That's sparging.

Conventional wisdom states that you have to draw out the wort from the bottom as you sprinkle or slowly pour hot water into the top of the lauter tun — that's the vessel, usually a picnic cooler or plastic bucket, with the false bottom used to separate the grain from the wort. That's where the water-in, wort-out balancing act takes effect.

This procedure was inspired by big, high-volume brewers. When you are producing millions of gallons of wort, you want to build the lauter tun

just big enough to comfortably hold the whole mash. In that case, sprinking is the only way to go.

But at home your mash/lauter tun is probably plenty big enough to hold your mash, plus most of your total sparge water. Why not save a step and add sparge water in quantity, instead of trickling it in a drop at a time?

If you think that makes sense, there might be some batch sparging in your future.

The Batch-Sparge Option

Mary Samuels, a homebrewer near Olympia, Wash., has been batch sparging for some time now and has successfully converted quite a few brewers to the technique.

"I prefer the method because of its simplicity. It eliminates the necessity to balance inflow with outflow. Plus, there may be a slight increase in yield, because resettling of the grain bed eliminates the effect of channeling that occurs when the grain bed is poorly settled," Samuels says.

"Channeling" occurs when sparge water seeks the path of least resistance in the grain bed, carving a channel through the grains. This reduces efficiency since that channeled water does not pick up as much extract on its way through the bed.

The method Samuels recommends for homebrewers is to drain off (into your brewpot) the first runnings after the mash is done and conversion is complete. Then add half your total sparge water at 170° F, stir the grain bed again, recirculate until clear, and drain into your brewpot. Add the remaining hot water and drain without stirring the mash.

As with other sparge techniques, you do not want to drain the grain bed too quickly. You need to allow the sparge water to do its work. Drain slowly.

"An additional advantage to batch sparging is that the sparge water is at the correct temperature when it is added to the mash and you do not have to worry about significant temperature drop," she says.

Why not add all the sparge water at one time, instead of splitting it into two additions? The reason is that after conversion, the mash contains two kinds of extract — that which is floating around as liquid surrounding the grain and that which is trapped inside the grains. If your sparge system can handle it and is not prone to stuck runoff, you should drain the grain bed nearly dry on the first go. Then, in theory, the sparge water will rinse out the secondary extract from the malt grains.

This method is not limited to homebrewing. Some small-volume professional breweries also sparge this way, including Sudwerk Privatbrauerei Hubsch in Davis, Calif.

Dave Sipes, Sudwerk's brewmaster, explains that batch sparging is necessary because of the design of the brewpub's 15-barrel system. "We have no hot liquor tank, just a temporary wort receiver. Our mash tun doubles as the kettle. So we pump the mash to the lauter tun, clean the kettle/mash

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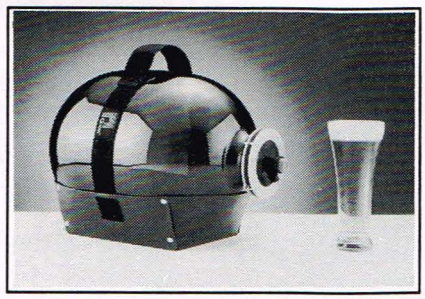
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tun and use it to heat the sparge water while we drain the first runnings. The sparge water is added in two additions while slowly raking the mash bed. As soon as the sparge is done, we pump the wort back into the kettle to start the brew.

"The sparge water sort of chases the wort around the system. By batch sparging we keep the hot wort from sitting around too long, which would encourage formation of DMS and other unwanted compounds," Sipes says. By DMS, Sipes means dimethyl sulfide, which gives beer a 'cooked corn' off-flavor, which is almost always undesireable in any style.

Sipes also oversees production in Sudwerk's 65-barrel micro system, which uses the traditional spray-sparge method. "I have not noticed any significant difference in wort quality. We have not done a formal study, but anecdotally speaking, batch sparging and spray sparging are equally effective at Sudwerk," Sipes says.

Homebrewer John Huegel, Erie, Pa., also regularly batch sparges. "It's simple. It lets me get started with the sparge quickly without worrying about flow rate and temperature. I do trickle sparge on occasion, but I do not have any sparge device. I just manually trickle the sparge water in. But the batch method is a lot easier," he says.

Huegel reminds brewers to dechlorinate sparge water, if you are using chlorinated tap water. This can be achieved by letting the water sit out overnight.

Huegel says his yield is about the same for each method. "I do not get tremendous yield either way, but it's the same at around 25 points per pound per gallon. I attribute this to my mill, a motor-driven Corona. I have noticed, on occasion, pockets of sweet, unsparged grain when I use the trickle method. This does not happen when batch sparging because the grain bed is stirred during the sparge process," Huegel says.

Maryland homebrewer Michael Daleiden is also a batch sparger. "It's so easy. With a good cooler for mashing, temperature variance is minimal. Batch sparging keeps me from worrying about maintaining the 'trickle' or maintaining temperature of the sparge water. I use the method for all my grain-brewing adventures," he says.

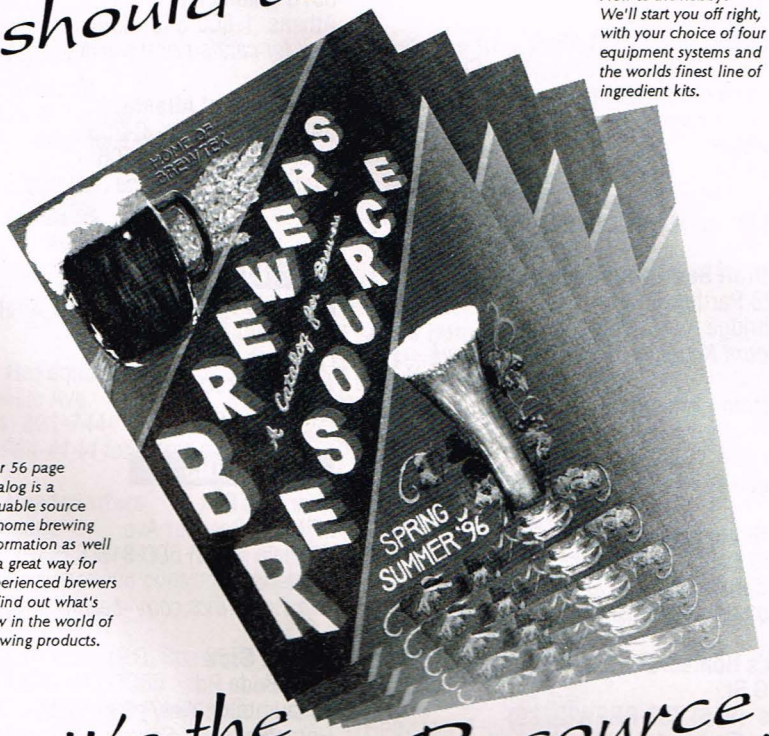
Sounds like batch sparging is preventing a fair amount of worrying out there. And if you are a partial-mash afficionado, batch sparging works just as well there, too.

Batch sparging works in any lauter system, as long as the system is not prone to stuck runoffs. If you are having that problem, you should consider a better lauter tun, anyway. Get a manufactured false bottom or use a slotted manifold or screen-type lauter system. The homemade "Zapap" double-bucket system probably has the most potential for trouble when you drain the grain bed nearly dry.

Give batch sparging a try. By making sparging less of a chore, it makes your brewing sessions even more relaxing. ■

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From Lynchburg Lemonade to Microbrews

by Steve Johnson

Everyone has heard of Jack Daniel, America's biggest name in whiskey. But not everyone has heard that Jack Daniel recently opened a microbrewery.

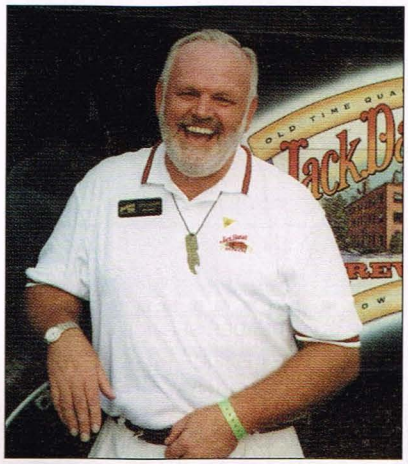
Jack Daniel is only one example of a beverage company adding a brewery to an existing operation. Benziger Family Winery will open a brewery in Glen Ellen, Calif., this May, and Korbel Champagne Cellars plans to open one in California, too.

The Jack Daniel Brewery story is unusual. First of all, unlike most breweries featured in this column it is not a mom-and-pop outfit, nor was it started by a homebrewer gone commercial. It is an example of a large company making a calculated effort to get into the brewing business.

The location of Jack Daniel is absolutely bizarre because it is in a dry county. That's right — the employees make it there, but they can't sell it there. That would be like making it illegal to drive cars in Detroit, surf in Hawaii, or watch movies in Hollywood. Lynchburg, Tenn., remained dry after Prohibition ended. Jack Daniel made its home in Lynchburg since 1866, so it stayed put. Although the brewery is in Lynchburg, the majority of Jack Daniel's beer is brewed at Hudepohl-Schoenling Brewery in Cincinnati.

The Lynchburg site is used mostly for testing new beers. Hudepohl-Schoenling is a traditional regional brewery that makes handcrafted beer. The batch size is 150 barrels, an output many microbreweries are approaching.

Another surprise is that such a famous company is based in such a small place. The population of Lynchburg is only 351. After entering the town limits, visitors have to drive more than five miles past cow pastures and corn fields before coming to anything that looks like a town. The quiet town center has a tree-shaded square with the county courthouse in the middle and local merchants crowded around the edge. Residents gather here to play their banjos on Saturday. The pace is almost slow enough for the proverbial yellow dog to lie down in the middle of the road and not be run over by a car. The entrance to the distillery is located just a block from the town center.



Brewmaster John Barrett aimed to impart oak-aged flavor to Jack Daniel's beer.

Although distillery-brewery tours run daily, visitors must trek the block back downtown to get to the gift shop. This is a conscious effort to draw tourists to other downtown businesses, says Brewmaster John Barrett.

Head Brewer Marty Winslow says adjusting to the local pace and customs was a challenge. True, Winslow had first learned to brew in Frankenmuth, Mich., a relatively small town, but the last two places he called home were large cities: Birmingham, Ala., and Knoxville, Tenn. Winslow has a typical type-A personality, that of a goal-oriented, impatient workaholic. He is also compulsive about attention to detail and sanitation — good qualities to have when running a microbrewery.

Winslow soon realized that to get any cooperation from residents, he was going to have to deal with them on their own terms. That meant slowing his



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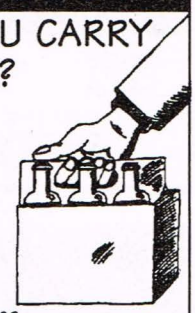
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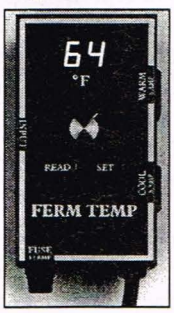
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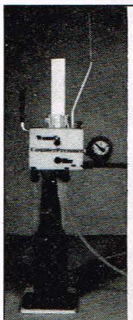
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pace, at times taking an indirect approach to reaching his goals, and getting to know his fellow workers better. "When you are running a brewery, sometimes there are not enough hours in a day, and the hardest thing for me to do is to force myself to slow down," Winslow says. "In Lynchburg saying 'Good morning' isn't enough; you have to ask them, 'How's the family?'"

Winslow and his wife have adjusted to the change of pace. He enjoys playing the banjo and keeps one at the brewery. He can be seen on occasion sitting on the loading dock with his banjo on his knee. The couple live on a farm some 20 miles out in the country. They spend many hours sitting on their porch watching their cattle.

There are many more differences between making Jack Daniel's whiskey and Jack Daniel's beer than there are similarities. Both are made from the same water, but this is where the similarity stops. The whiskey is made primarily from adjuncts, such as corn and unmalted rye. Malted barley is also used because its enzymes help the conversion of starches to sugars during the mashing process.

The beer is made exclusively from malted barley. Beer solids are mashed in one vessel, then the boil occurs in another with the solids removed. Whiskey, on the other hand, is mashed and boiled in the same vessel, and the solids are left in. The whiskey is boiled only momentarily, whereas the beer is boiled for more than an hour. "(Distillers) can knock off a batch of whiskey in two hours, whereas it takes us eight," Winslow says.

Next in the whiskey-making process, the grains are pumped directly into the fermenter, solids and all. In brewing only liquid goes in. Another major difference is Jack Daniel allows the whiskey to sour and even adds a lactobacillus culture to ensure that this takes place. This would be unthinkable in almost any American brewery; only Belgian breweries and breweries making Berliner-style beer are eccentric enough to do this on a regular basis. Also, the distillery uses a fresh yeast culture for each batch, whereas the brewery harvests its yeast and repitches it in later batches.

Both products are filtered but by different methods: the beer with a diatomaceous earth filter and the whiskey through a 10-foot-deep charcoal filter.


Head Brewer Marty Winslow has had to adjust to working in a busy brewery in a slow-paced town.

Jack Daniel's whiskey ages for at least five years, whereas its lagers age 28 days, about two weeks longer than ale. The 28 days of aging account for its slogan, "Slow Brewed." Whiskey, on the other hand, takes years to blend and mellow its flavors. Beer, of course, begins to deteriorate much more quickly.

This leads us to the most important difference in the process, distillation. Winslow says that the high alcohol level created through distillation eliminates any potential bacterial problems. Beer, on the other hand, is not distilled and is prone to spoilage. In a brewery bacteria count is critical. Winslow is particularly obsessed with bacteria because Jack Daniel's beers are particularly subdued in flavor. This means that any bacterial taint would be readily apparent.

Winslow says many microbreweries are hit-or-miss on their quality control due to lack of proper packaging and testing equipment, lack of knowledge, or both. Improper packaging and testing leads to short shelf life and spoilage. The air levels in bottles are crucial to beer stability, and the air levels coming from many microbreweries are way too high, Winslow says. For this reason Jack Daniel has improved the specifications on the bottling line in order to reduce air levels.

With increased competition in the microbrewery business there is little room for mistakes, unlike during the early days, Winslow says.

Despite all the talk about consistency and quality control, Jack Daniel's beers are not "robust" by any stretch of the imagination. "Delicate" is what some would say; "bland" is what many homebrewers would call it. It is odd that the maker of a whiskey with so much character would make a beer that doesn't knock your socks off.



Brewmaster John Barrett took a stroke at solving this dilemma. He combined some of the character of the whiskey with all of the Jack Daniel's beers — Jack Daniel's 1866 Classic Oak-Aged Pilsner, 1866 Classic Oak-Aged Amber Lager, and 1866 Classic Oak-Aged American Ale. The key, as you might have guessed, is "oak aged."

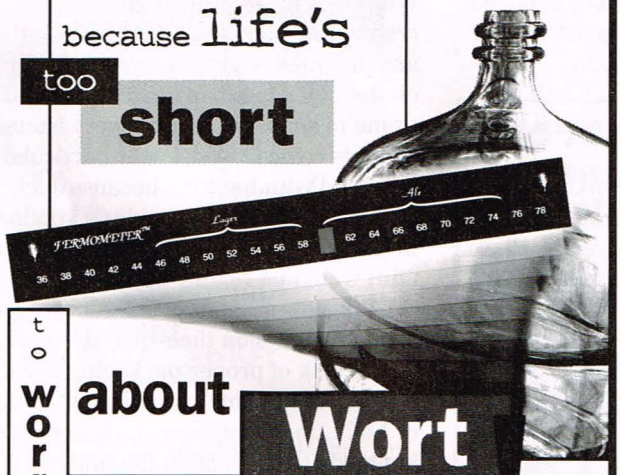
Barrett developed a process by which some of the character of the whiskey is imparted in the beer. The whiskey itself, of course, can't be put in the beer, but the oak flavor can. Old Jack Daniel's whiskey barrels are shredded and then baked to make sure all the alcohol is removed and microorganisms killed. The shredded oak is then put in the aging tanks with the beer. The flavor is subtle, but if you try one of the beers, you might notice the Jack Daniel's character.

Because Jack Daniel's beers are subdued in flavor, the brewers have to be very concerned about bacteria and quality control.

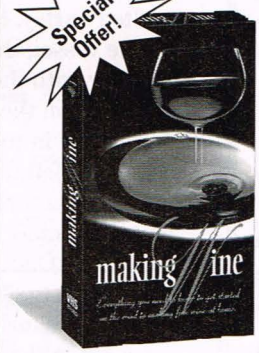
You can purchase Jack Daniel's beers in Tennessee, Kentucky, Georgia, South Carolina, North Carolina, Virginia, and Maryland.

If you're in Tennessee, make the trip to Lynchburg — it's about halfway between Nashville and Chattanooga — to tour the brewery and distillery. Next to the brewery is a museum with some nice 19th- and early 20th-century beer advertising items, such as trays, bottles, posters, and photographs. ■

Steve Johnson lives in Clemson, S.C., and is the author of three brewery guidebooks: On Tap: a Field Guide to North American Brewpubs and Craft Breweries, On Tap New England, *and* On Tap Northern California.

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A Twisted Tale of Alt Beer

by Mark Mertes

I have been homebrewing since January 1995. I enjoy it so much that I've shared the thrills of this hobby with many others. Some have stayed as brewing partners and some have gone, but the one person who seemed to like it the most was my first cousin and good friend, Nick Heus.

I remember brewing my first batch of beer using an old enamel cooking kettle for the boil and a plastic bucket for fermenting. Nick, who's a gadget kind of guy, wasted no time scrounging up stainless-steel pots to cook with and buying glass carboys in which to ferment the beer. Nick read everything he could get his hands on. He spent a few extra hours at the microbrewery in Chilton, Wis., asking the brewmaster all kinds of questions. He even grew his own hops that spring.

Within half a year Nick started constructing a 10-gallon brew system and converting an old institutional coffeemaker he found at the local dump into a mash tun, a stainless-steel half barrel into a cooking kettle, and a large stainless-steel bucket into a liquor tank. He turned some copper tubing into an immersion-type wort chiller, and created all kinds of gadgets that would make a professional look twice.

With his system ready to fire up, Nick decided his first batch would be an alt beer. The initial plan was to brew outside in the backyard gazebo while cranking up the Moody Blues on cassette, but it began to rain. The brewing would have to take place in the same building the system was built in — the work shop.

With the windows and doors open for adequate ventilation, Nick fired up the brew system. Despite a few setbacks, such as a stuck runoff in one of the mash tuns and a very noisy and slow recirculation pump for the wort chiller, his first batch of alt with the new system turned out quite well. First-batch good luck? Maybe.

About a week after he completed his second batch of beer (an oatmeal stout), devastation struck his small, rural home of Marytown, Wis. On July 18, 1996, a tornado ripped through the community, destroying homes and landscape. Nick's house stayed intact, but the local authorities ruled that the house was uninhabitable. Nick's hop yard and almost all other vegetation were destroyed. Fortunately no one was killed or seriously injured.

After people assessed the mess and got the cleanup well under way, an interesting question circulated in the community. Had Nick's brewing system survived the tornado? Everyone was finding a lot of brew stuff scattered around the neighborhood. Volunteers were picking up empty beer bottles and finding malted grain all over the place. One of his mash-tun covers was found a week later a quarter of a mile away in a wheat field.



In front of his battered house, Nick Heus gathers his recovered brewing equipment.

Lo and behold, Nick's brew system was found under a pile of rubble that used to be his garage. Apart from a bent wort chiller, the brew system was still intact. The news slowly got around, and soon a five-gallon keg of his first batch of alt, which survived the storm in the basement, was brought out, put on ice, and served to quench the thirst of those who helped in the cleanup. Some of the folks tasted a homebrew for their first time and were pleasantly surprised by its flavor — certainly more flavor than they were accustomed to.

Somehow the seriousness of the day turned humorous after people wanted to know what Nick was going to name his beer. After exchanging different titles such as Tornado Alley Ale, Windy Day Yesterday, Whirlwind Ale, and others, Nick came up with a suggestion. It was to be named Alt Twisted Up. Instantly everyone agreed, and a new name was born.

Since that day of destruction, Nick has assured us he will brew the alt recipe again. He's even considering adding a few different "twists" to make it better. He has considered serving the beer with a twist of lemon or lime, trying a new brewing technique such as whirlpooling the wort to separate the trub from the sweet liquid, or maybe even waiting for a very windy day to brew his next batch (excluding a tornado, of course).

Regardless of how he's going to brew his next batch of Alt Twisted Up, Nick wants to brew it again to remind all who taste his beer of what Mother Nature can — and *did* — do to everyone that day, to thank God no one was killed, and to show how a disaster helped strengthen the community by pulling people together in times of need.

For that Nick says thank you and prost! ■

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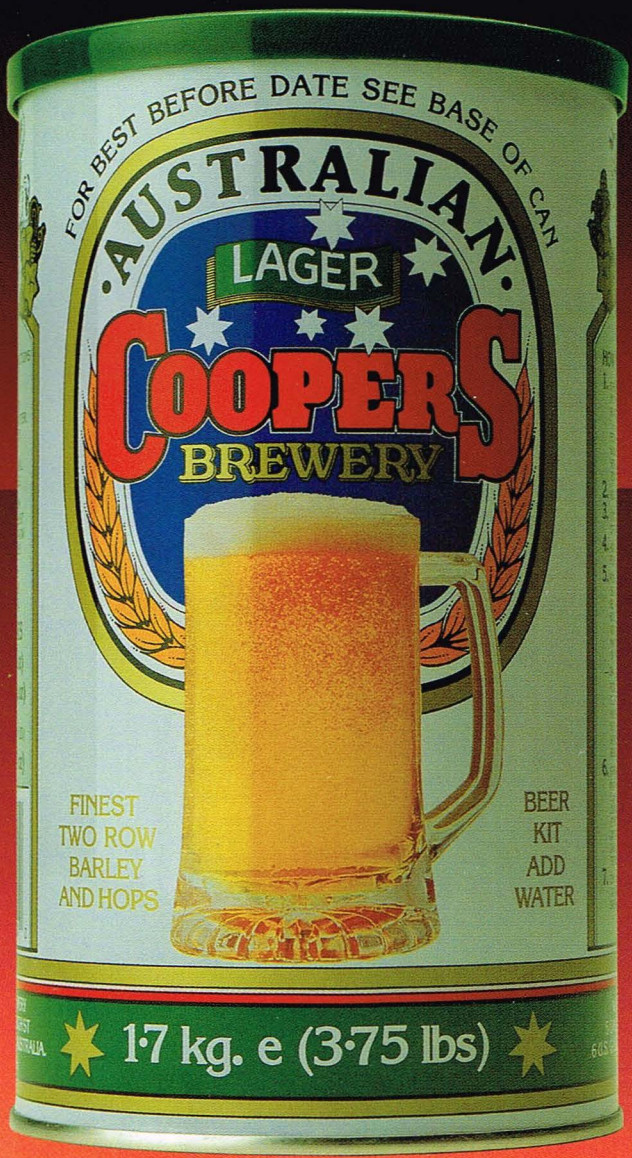
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