

Brew

APRIL 2000, VOL.6, NO.4

THE HOW-TO HOMEBREW BEER

Hot Tips

For Making Smoked Beers

3 Hard Beers
Made Easy

Your First Keg

Build a Hopback!

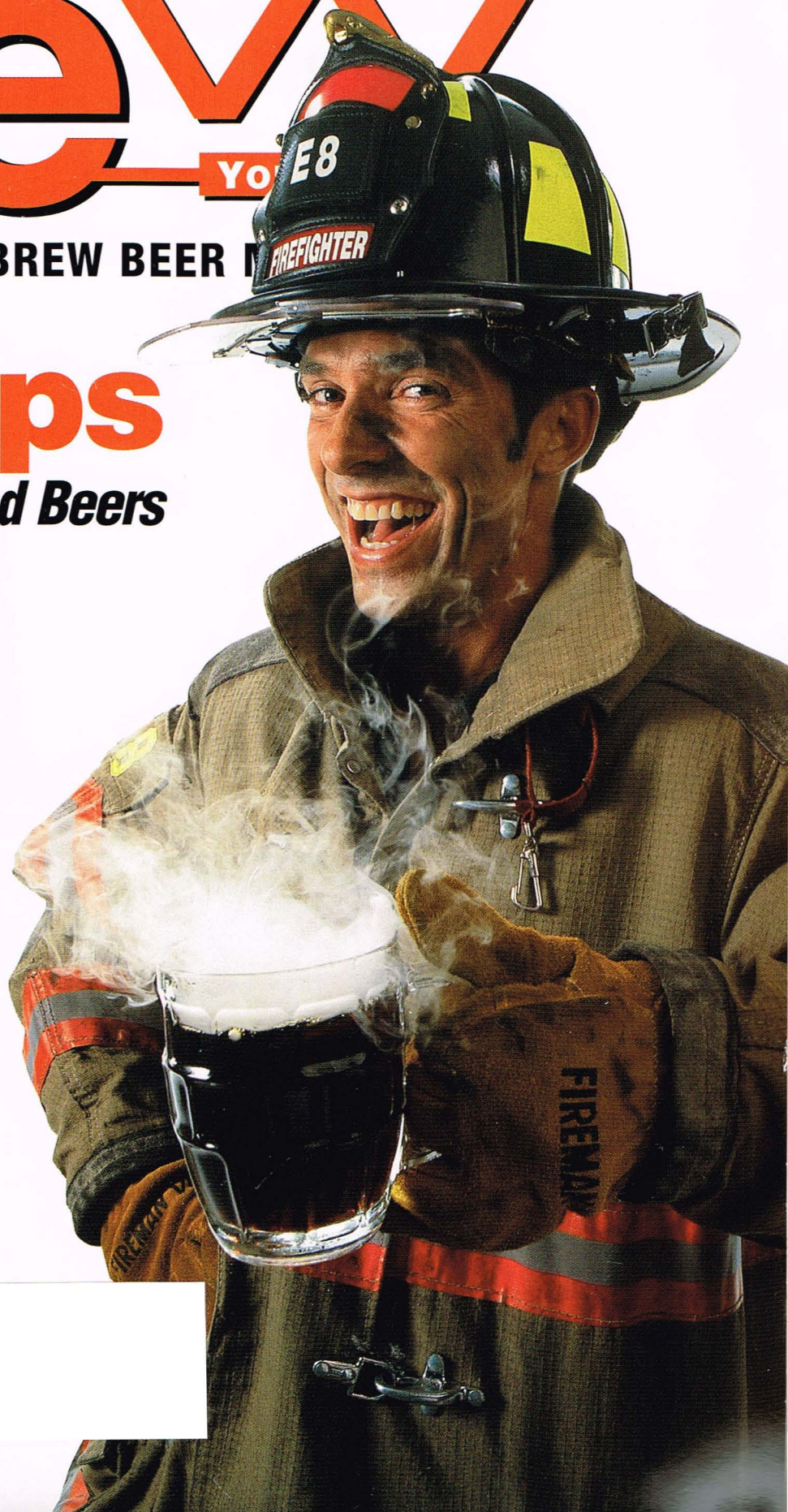
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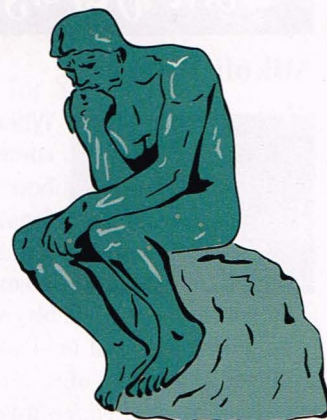
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Rationing Smoked Beer

A few years back, Brad and I special-ordered a case of Alaskan Smoked Porter, the beer made famous by its sublime flavor — and the string of gold and silver medals it's won at the Great American Beer Festival. When the case arrived, we stashed the bottles in our basement and promised to save them for special occasions.

As it turns out, we have a loose definition of "special occasion." Brad would pull out a bottle on, say, your basic Wednesday. He'd pour it into a pint glass, and I'd be so jealous that I'd go grab one for myself. Other times, I'd justify a bottle by seeing another TV teaser for "a very special episode of E.R." Special episode? Hot damn! Get the porter!

As our supply dwindled, we started to exercise some restraint. For quite a while, we've had one bottle left, and we really do seem to be saving it, because, well, once we drink it, we won't have any more Alaskan Smoked Porter.

We haven't tried to brew our own smoked porter yet, but as soon as that bottle disappears, it'll be time. That's why we're so happy to be publishing "Hot Tips For Making Great Smoked Beers at Home" (page 22). In this month's cover story, Scott Russell tells homebrewers how to get that great smoky flavor in their beer, whether you use extracts or smoke your own grain.

The story includes sidebars written by two esteemed Masters of Smoke: Geoff Larson, the founder of the Alaskan Brewing Company and the man responsible for that famous porter; and Greg Noonan of the Vermont Pub and Brewery, whose Vermont Smoked Porter is legendary in New England and far beyond. We're delighted to have these talented brewers writing for BYO. I think we'll celebrate by splitting that final bottle.

KATHLEEN

Contributors

Mikoli Weaver



When it comes to beer and food, Mikoli Weaver is

a Renaissance guy. He has a bachelor's degree in food science from the University of Washington, studied for a year at culinary school in Italy and has worked as a professional chef.

Mik started his beer career as an assistant brewer at the

Pioneer Brewing Company in Hayden Lake, Idaho. Since then, he's headed brewing operations at T.W. Fisher's in Coeur d'Alene and the Woodland Brewing Company in Portland. He now works at Belmont Station, a beer-shipping business attached to the legendary Horse Brass Pub.

Mik has written our "Style of the Month" column since January 1999 and is a guru of far-flung styles, from the Scottish spruce ale he describes in "Three Hard Beers Made Easy" (page 32) to his current favorite: Cantillon Iris, a Belgian gueuze-lambic.

Mik's a man of many facets. We're glad to have him around.

Brew
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What is ESB Malt?

Dear Brew Your Own,

The "Style of the Month" recipe for barleywine (January 2000) calls for "ESB malt." My local brewshop has never heard of it. Can you elaborate on this and tell me where I can obtain this malt?

Paul T. Swanson
via e-mail

Author Mik Weaver says: "ESB refers to Gambrinus ESB pale, a two-row variety malt. It's about 3° Lovibond in color with a listed protein level of less than 10.9."

Coors Kegger

Dear BYO,

I've never made any homebrew, but I'm going to give it a try. Should I try bottled beer or can I make draft? Any information on the pros and cons would be greatly appreciated. Also, I bought an empty Coors 7.75-gallon keg and tap at a flea market. Is it possible to use this? If so, how do I get the beer in?

Robert Carter
via e-mail

First, check out "Life Beyond the Bottle" in our new "Techniques" department (page 43). It talks about the pros and cons of kegging and handily walks beginners through their "first keg."

Author Gretchen Schmidhausler replies: "If you're talking about using the Coors keg as a brewkettle, you've got a big project ahead of you. You'll need a good welder to convert your keg to a kettle — one experienced in working with stainless steel, which is tricky. Pressure must be released (very carefully!) and the top cut out and smoothed. Have a hole drilled and a valve fitted at the bottom. A full-service homebrew shop may know of someone who can do the job right."



Honestly, it's really much easier just to buy a new brewkettle at a shop.

If you are asking about putting beer in a Sankey keg, either to condition or to serve, good luck! You'll never get that keg — which probably contains old nasty beer — clean unless you buy a device to remove the valve (around \$500) or build a cleaning contraption. If you bought it cheap, it may even have a damaged seal or a pinpoint hole. The bottom line: If you want to keg your beer, just buy a Cornelius set-up, or some other type of kegging system, at a homebrew shop.

Winter Warmer

Dear BYO,

The article "A Delicious Way to Celebrate" by Tess Szamatulski (December 1999) had a brew recipe, "Welcome to 2000 Winter Warmer," that looks really good. But the stated ABV of 6.5% does not fit the OG and FG. Am I missing something?

Ed Lilliott
via e-mail

You're on the ball, Ed. Seems like our usually perfect proofreader goofed. The correct figures for the Winter Warmer recipe are OG = 1.067, FG = 1.016 and 6.5% ABV.

Vodka for Sterility

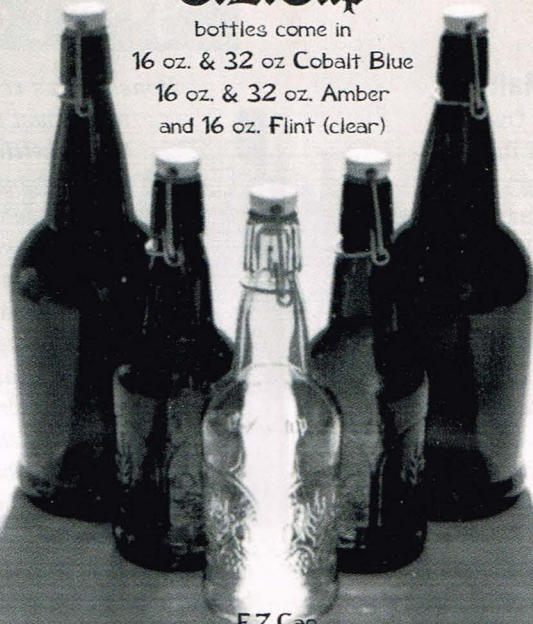
Dear BYO,

I have a tip that I'd like to share with your readers. When I use an airlock on a glass carboy during fermentation, I put vodka in the airlock rather than water. This helps to keep the area sterile and also reduces the risk of contamination. I also put a little vodka in a plastic spray bottle and then spray the top of the stopper and carboy. If a little bit of vodka gets in the beer, it's no big deal.

David Byhardt
via e-mail

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A Man of Many Questions

Dear BYO,

In "Build This Mash Tun for Under \$50" (September 1999), what's the material between the pizza screens that made up the mash bed — and why not use just a third screen? Where did the author get this inner material?

Did the denser material catch the malt, since the screens alone would let too much through? If so, then how did he clean this nice mess? Again assuming that the inner sandwiched material caught the malts, would some kind of wing-nut set-up work, so that the screens could be separated, as opposed to riveted — thereby making clean-up easier? Also, how was the hot water added — he didn't use a sparge arm, so did he just dump it all in and mix up the grain, let it settle and then draw off the wort? When he added the second temperature setting of water and ran more liquids through to get the appropriate volume for his boil, how did he add it so it didn't disturb the mash bed?

Mike Shearer
Eagle River, Alaska

Author Thom Connell responds:

"The material between the screens is copper window screen from a hardware store. The screen prevents too much grist from going into the bottom of the tun. Clean the screen in hot running water; strike it sharply when wet and again when dry. A wing nut would be okay (if it's made of stainless).

As for the hot water, I added it this way: four gallons makeup, several quarts added plus some grist, mix it up, add more water, grist, mix, and so on. Other additions are made and the grain bed mixed to within an inch of the screens. For mash-out and sparge I use a Pyrex measuring cup. With a grain bed six to ten inches deep, disturbing the upper area doesn't mean a thing. When you see "the mountains of the moon" appear, add more water (an inch above that level). I'm getting beyond 80 percent efficiency." ■

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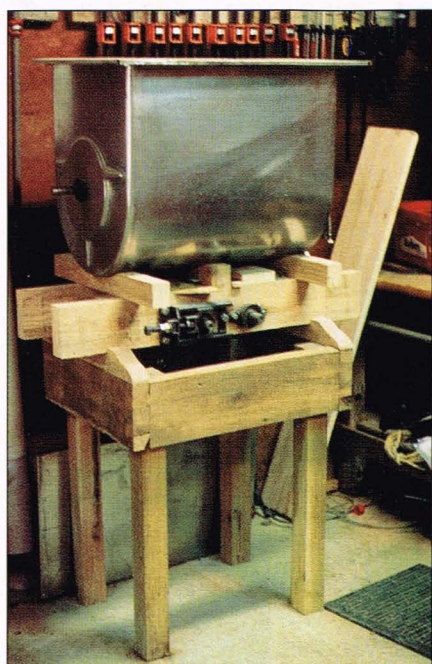
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CIRCLE 7 ON READER SERVICE CARD

Inspect your gadgets

The big grind, gauges and a brew sink

Gerald Bohrn
Jefferson City, Missouri



In a former life, the bin on my grain mill was used to knead dough at a bakery.

My wife says it's a hobby out of control. Maybe it is, but it's kept me from turning into a mush-head since I retired from my career as a railroad conductor. I'm now putting my energies into my dual interests: homebrewing and woodworking.

I spend my free time roaming around salvage yards and sales, finding discarded stainless steel equipment and parts from this and that. One of the things I've built is a grain mill. All the parts were salvaged except the adjustable stainless-steel rollers; I had those made at a local machine shop.

The mill is pretty big. I figure it can hold about 150 pounds of grain. Since I brew 15-gallon batches, I've never filled it up all the way. It'll crush all the grain I need, maybe 20 or 25 pounds, in five min-

utes. The big stainless-steel container that holds the grain came from a bakery. I think they used it to knead dough. The motor and gears came from one of those kiddie rides, like a vibrating airplane or a bucking horse, that you sometimes see in front of big stores like WalMart. It's a 1/2-horsepower motor with a 40-to-1 gear drive.

The rollers are six-inch diameter by eight inches wide. This was by far the most expensive part of my grain mill. It cost me \$600 to have the rollers made, but the rest of the mill cost less than \$200. The lumber, for example, I collected for free from a falling-down barn on my property in Missouri.

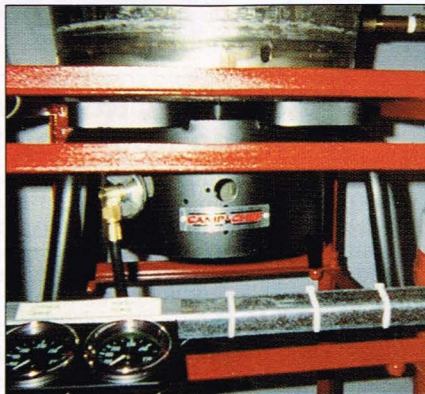
This set-up works great for me. And it'll come in handy when I fire up my 80-gallon brewing system that's currently in the works!

Glenn Looper
Keizer, Oregon



I built a three-tier all-grain system and added two handy temperature gauges.

I think part of the fun of homebrewing is collecting and building all the gadgets. I customized the three-tier all-grain system I built by adding two temperature gauges that originally were made as engine-block controls. One gauge is for my mash and sparge water. The other gauge monitors mash temperature. The temperature probes work well inside the pots. I've double-checked the inside temperature with two other thermometers; the accuracy is amazing and my temperature range is just right.



One gauge monitors mash and sparge water; the other, mash temperature.

Don Dianda
San Lorenzo, California



Dianda cut a 55-gallon malt drum in half to make this portable brewing sink. He soaks bottles in the other side.

I used to wash my brewing equipment, like five-gallon buckets and carboys, in the bathtub. They were too big for the kitchen sink. But using the bathroom was a hassle. It was awkward and messy, and my wife found nothing humorous in the idea of me washing my dirty brewing equipment in the tub.

A few months ago, I came up with an idea. I got an old 55-gallon

malt drum, for free, from a local homebrew shop. I cut it in half with a reciprocating saw and a metal cutting blade.

I use one side of the barrel as a brewing sink. As you can see in the picture, I can simply attach a garden hose to the simple faucet I rigged up. The faucet parts cost less than \$20. Also, it helps to get a malt drum made by Edme (the big beer-kit and extract company), because their drums have a threaded hole in the side as well as on each end. The hole in the side makes a perfect drain for the sink. The sink is portable, so now I can wash all my equipment outside on the patio, or in the garage. Wherever the garden hose can reach.

I use the other half of the drum for soaking bottles. It holds up to 50. The threaded drain on this half is on the end of the barrel, so I prop

up the other end for better draining. This works just fine.

I've been homebrewing for about 20 years. My favorite styles are barleywine, ESB and wheat beer. I work two jobs — one of them is a part-time position for Williams Brewing, a mail-order homebrew supply warehouse — so I'm too busy to join a homebrew club. But I always find time to work on my homebrew equipment! I'm also proud of my tap system, with two homebrews on draft. ■

Really Nasty Brew

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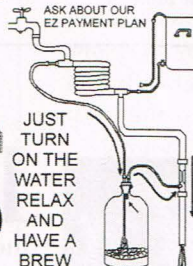
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CIRCLE 19 ON READER SERVICE CARD

What's The Buzz?

An Export Stout from the old British colonies

by Scott R. Russell

Several great styles of beer are linked to seafaring Brits and their influence on foreign markets. The story of India Pale Ale is well-known by now, with the legendary effects of slow boats to India, a double journey through the tropics, rolling the barrels on the swell and the repeated heating and cooling of the beer.

Perhaps less well-known is the tale of the "Foreign Stout," also known as "Export Stout." Most stories agree that as the British took possession of Caribbean, African, Southeast Asian and other territories, they had a yearning for far-away England. What these officers missed most about their homeland was not the theater,

the universities and the elegant society, but the horse races, the cricket — and the beer. So they began to train the natives to race horses, to play cricket — and to make fine English beer.

To stand up under the tropical sun and heat, the beer had to be more substantial than the stuff brewed back home. So local breweries, joined soon by installations owned by Bass, Guinness and other major breweries from the British Isles, began to make a bigger, thicker, sweeter stout. Today, there are still breweries throughout the former British colonies in Africa, the

Caribbean and Southeast Asia, that make pale ales, English-style lagers and "foreign" stouts.

One common characteristic of these beers is a certain harsh flavor, a roughness that's typical in most ales but exaggerated by the climactic conditions in which they are brewed. My "Big Buzz Foreign Stout" has some of that too, softened by the addition of honey. I don't know if any "colonial" breweries use honey in their stouts, but it works for me. It takes away the worst of the bitterness and harshness, and contributes a certain mellow sweetness that I find pleasant under the tropical sun and heat of my mountain home in Vermont — a former French colony.

Big Buzz Foreign Stout (5 gallons, partial mash)

Ingredients:

- 2.5 lbs. pale malt
- 1 lb. dark crystal malt, 120° Lovibond
- 1 lb. roasted barley
- 3 lbs. unhopped dark dry malt extract
- 1.5 lb. wildflower or dark honey
- 1 oz. Northern Brewer hops (8% alpha acid, 8 AAUs)
- 1 oz. Goldings hops (4% alpha acid, 4 AAUs)
- English or Irish ale yeast (Wyeast 1098 or 1084)
- 3/4 cup corn sugar for priming

Step by Step:

Heat 6 qt. water to 164° F. Crack the grains and add to liquor, holding at 152° F for 75 min. Begin runoff and sparge with 8 qt. of 168° F water. Add the dry malt extract and the honey to

runnings and heat to boiling.

Boil 15 min., add Northern Brewer hops. Boil 45 min., add Goldings hops and boil 30 more min. Remove from heat, cool, and add to fermenter along with enough pre-boiled, chilled water to make 5.25 gals. When the whole wort is cooled to 68° F, pitch the yeast.

Seal and ferment at 65° to 68° F for six to seven days, rack to the secondary and age-cool at 55° to 58° F for two to three weeks. Place secondary in a slightly warmer spot (68° F) for two days to finish, then prime the beer with corn sugar and bottle. Bottle-condition at cool temperature (55° F) for two to three weeks.

OG = 1.060 (15° Plato)

FG = 1.018

Bitterness = 36 IBUs

All-grain: Heat 12 qt. water to 163° F. Crush 7 lbs. pale malt plus the crystal and roasted barley (as above), mix into mash liquor. Hold 75 min. at 153° F. Runoff and sparge with 15 qt. at 168° F. Add honey to kettle, bring to a boil and proceed as above. Time boil and hop additions to evaporate wort to final volume of 5.25 gal.

Extract: Steep crystal and roasted barley (as above) and .5 lb. pale malt in 2.5 gal. at 152° F for 45 min. Remove grains, add 4.5 lbs. dark dry malt extract and honey, bring to a boil and proceed as above from onset of boil.

On yeast: Stouts are known as an Irish style, but foreign stout would most likely have been brewed with English yeast. If you prefer the flavor profile of the Irish ale yeasts, go right ahead!

Reader Recipes

Vanilla Yella (5 gallons, extract with grains)

Here is my Vanilla Cream Ale, with just the right vanilla flavor.

*Kraig Krist
Annandale, Virginia*

Ingredients:

- 7 lbs. Extra Light malt extract syrup
- 8 oz. crystal malt, 10° Lovibond
- 1/2 lb. carapils malt
- 1 oz. Fuggles hop pellets (4.5% alpha acid, 4.5 AAUs)
- 0.5 oz. Cascade hops (6% alpha acid, 3 AAUs)
- 3 oz. pure vanilla extract
- 4 oz. lactose
- 14 g. dry ale yeast
- 3/4 cup corn sugar boiled in 2 cups of water to prime

Step by Step:

Crack the grain and put in a grain bag. Heat 1-1/2 gal. of water to 155° F. Remove the kettle from heat. Put grain bag into the kettle and cover. Allow to steep for 30 min. After 30 min. remove the grain bag. Add malt extract and enough water to get 6 gal. Stir well. Do not return kettle to heat until malt extract is dissolved.

Bring the kettle back to boil. Total boiling time is 60 min. When the boil begins add 1 oz. Fuggles hop pellets. With 15 min. remaining (45 min. into the boil) add 1/2 oz. Cascade hop pellets. Cool, transfer to the fermenter, take hydro reading and pitch yeast.

After four to seven days (when the fermentation slows), transfer to secondary. Boil 2 cups of water and 4 oz. lactose for 10 min. (Lactose is an unfermentable milk sugar. If you're lactose intolerant, it's okay to omit it.) Allow to cool and add to secondary. After another seven days, you're ready to bottle. Prime and bottle. Add 3 oz. pure vanilla extract to the bottling bucket. Stir well. It'll be ready to drink within a week after bottling.

OG = 1.056 (14° Plato)
FG = 1.012
Bitterness = 20 IBUs
5.4% ABV

Spring Wit (5 gallons, extract)

The orange and coriander flavors added at the end of this recipe make me think of a nice spring day.

*John Stecker
Montgomeryville, Pennsylvania
(Keystone Homebrew Supply)*

Ingredients:

- 1 can (4 lb.) Alexander's Pale malt syrup
- 1 can (4 lb.) Alexander's Wheat malt syrup
- 1 oz. Tettnang hops (4% alpha acid, 4 AAUs)
- 0.5 oz. bitter curacao orange peel
- 1 oz. coriander (crushed)
- Wyeast 3944 (Belgian White Beer)

Step by Step:

Heat 1.5 gal. water, add the extracts and bring to a boil.

Add the Tettnang hops, boil 58 min., add the orange peel and the coriander, boil 2 min. Chill the wort in an ice bath, add enough water to make 5 gal. and pitch the yeast when wort is ideally below 80° F.

Ferment at 60° F for one and a half weeks and prime with 3/4 cup honey. Let sit two weeks and enjoy.

OG = 1.055 (13.75° Plato)
TG = 1.015
Bitterness = 24 IBUs
5.1% ABV

Dumb Blond Ale (5 gallons, extract with grains)

Recently, a customer brought in a bottle of Redhook Blond Ale for us to taste and asked us to come up with a recipe for it. We played around with it and came up with something we really like!

*Kristine Perez
Tacoma, Washington
(Cascade Brewing Supplies)*

Ingredients:

- 6 lbs. pale malt extract syrup
- 1/2 lb. biscuit malt
- 1/2 lb. wheat malt
- 1/2 lb. crystal malt, 10° Lovibond
- 2 oz. Czech Saaz hops (3.5% alpha acid, 7 AAUs)
- 0.5 oz. Saaz whole hops (3.5% alpha acid, 1.75 AAUs)
- 0.5 oz. Saaz whole hops (3.5% alpha acid, 1.75 AAUs)
- White Labs East Coast Ale yeast or Wyeast 1235

Step by Step:

Steep the grains at 155° F for 15 to 20 min. in 1.5 to 2.5 gallons water. Rinse the grains. Add the extract. Stir to dissolve and heat to boiling. Add 2 oz. Czech Saaz (7 AAUs), boil 50 min. Add 0.5 oz whole hops Saaz (1.75 AAUs), boil 10 minutes.

Turn off the heat and add an additional 0.5 oz. whole hops Saaz (1.75 AAUs). Cool the wort as quickly as possible. Add enough water to make 5 gal. Pitch the yeast when the wort is cool enough. Ferment at 68° to 73° F. Age one week in secondary when the fermentation is complete. Prime and bottle. Age four weeks in bottle.

OG = 1.050 (12.5° Plato)
TG = 1.012
Bitterness = 30 IBU
4.8% ABV ■

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Blinding Me With Science

The Wise One on dry ice, ozone and more

Mr. Wizard

Carbonation with dry ice may be catastrophic, Mr. Wizard (February 2000)! While this idea seems workable, there is one serious flaw in the logic. The carbon dioxide will not dissolve into the soda as rapidly as it changes from a solid to a gas. As the gas builds in whatever head space there is, pressure can quickly build to 800 psi, if the bottle holds out that long. At the very least, the bottle will split and spill soda — at the worst the cap could be a deadly projectile.

Bob Hyndman
via e-mail



time so as not to leave a residue.

Also, what do you think about passing finished beer or wine through the ozone machine and using it as a yeast filter? It seems as though the ozone would kill the ambient yeast still in the finished beer, as well as any foreign bacteria that might still be present when it's time to keg or bottle the batch.

K. Hewitt
Salina, Kansas

When ozone is bubbled through water, the water is said to be "ozonated." Ozone is a potent oxidizing compound due to its instability and it breaks down according to the

following chemistry: $O_3 \rightarrow O_2 + O\cdot$

The O_2 of this equation is the most common form of oxygen in the atmosphere but the $O\cdot$ is special and is known as free radical oxygen. Free radicals are very reactive chemical species and, among a long list of attributes, lethal to microorganisms. The lethality of free radical oxygen makes ozonation an effective method of sterilizing water, commonly used for bottled water. The free radical oxygen eventually combines with other free radical atoms to become garden-variety O_2 , so ozonation leaves no residual.

Ozonated water is not used in breweries as a sanitizer, although

some breweries do use ozonated water to rinse bottles prior to filling. Ozonated water may work as a sanitizer for equipment, but to my knowledge this would be a new application. I would recommend using a conventional sanitizer unless you wish to pursue your idea on an experimental basis.

Coming up with new technology is exciting, but your second idea would ruin your beer. For starters, ozonation would oxidize beer to the most extreme end of the oxidation spectrum. Also, free radical oxygen initiates rancidity, the breakdown of fats and oils into fatty acids.

Use ozonated water in any brewing step requiring water, if you want — there will be no harm done in mashing, and if you dilute your wort after cooling it may add a little bit of oxygen prior to fermentation. However, resist the temptation of running beer through an ozonator. Not only will this ruin your beer, it may damage the device!

Mr. Wizard

I brewed a batch of lager (a three-gallon batch in a five-gallon carboy) and instead of the normal CO_2 venting out of the air lock, a vacuum formed. I used a wort chiller and pitched the yeast at 72° F. At 18 hours the cap was sucked down onto the vent tube with liquid (vodka) suspended in the vent tube (wort temperature 64° F sitting in my basement). I moved the carboy to a refrigerator sitting in a cold garage and the wort temperature dropped to 54° F over the next 18 hours. The same vacuum

Mr. Wizard

Would you recommend using water with ozone in it to sanitize brewing equipment rather than chlorine? I found a local dealer who sells an "under the sink" ozone machine that connects in-line to your existing water line. He said that the ozone would not affect the stainless steel and would dissipate after a short period of

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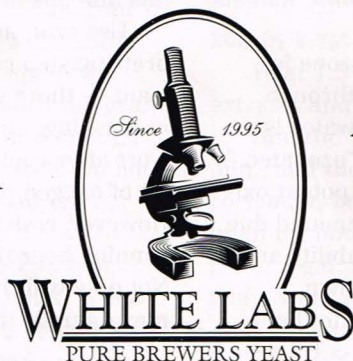
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was present at 36 hours. Finally after 48 hours a slow fermentation was going with the cap raising, but it was three-plus days before a strong fermentation was present. Could the rapid temperature change or poor yeast start have caused the vacuum? What happened and what can I do to prevent this in the future?

*Larry Silbernagel
via e-mail*

What happened to your fermenter was due to the relation between gas temperature, volume and pressure. A sealed container will exhibit a decrease in gas pressure if the container is cooled and conversely its pressure will increase when heated. Fermentation airlocks allow gas to escape and a cool carboy that is heated will not build pressure. However, a warm carboy that is cooled will exhibit a drop in pressure. This vacuum will suck liquid from the airlock into the carboy. Eventually the airlock will be empty and the vacuum will be relieved.

If your fermentation took off more quickly and/or your wort was cooled to the same temperature as your basement this would not have occurred. This phenomenon is easy to avoid early in the process, but if you cool your airlocked carboy after the primary fermentation is complete, the vacuum will return. I prevent any liquid from an airlock being sucked into my beer by removing the airlock and covering the carboy with aluminum foil. After cooling, I replace the airlock.

Vacuum is not a major problem for homebrewers, but it is perhaps the most devastating force present in large tanks. Big tanks are designed to withstand some sort of pressure, but are rarely designed to cope with vacuum. Big tanks can be sucked in like a tin can if they are not treated properly, for example rinsing a large tank with cool water after a hot wash. If you keep in mind that a vacuum is created when you go from hot to cold you will easily prevent this problem.

Mr. Wizard

I recently brewed a Scottish ale with a beginning gravity of 1.074 and an ending gravity of 1.014. I used Mt. Hood hops (5.3 percent alpha acid) for bittering. The recipe called for 35 IBUs. When I racked into secondary, after five days in the fermenter, it still tasted excessively sweet, perhaps from old, improperly stored hops? Is there any way to compensate (boil and extract hops and add it to the secondary or champagne yeast to further ferment, for example) or am I doomed to make a bitter batch and make half and halves?

*Russ Root
Windsor, New York*

When hops are stored they lose their bittering value over time due to oxidation. Hops are always sold based upon the alpha content at the time of harvest and it is very easy to get hold of some old hops and brew a batch of beer that lacks the anticipated bitterness.

Commercial breweries attempt to brew a consistent beer and frown on such problems. Some brewers will carefully monitor their hops during storage and the wort leaving the brewhouse; if the bitterness is out of specification they adjust their recipe. Other brewers take a different approach and adjust the bitterness right before filtration. The easiest way to do this is with pre-isomerized hop extracts. Hop aroma can also be adjusted in a similar fashion using hop oils.

Homebrewers have access to both hop oils and pre-isomerized extracts. These extracts are usually very concentrated — a very small amount goes a long way! Dilute the extract to make the measuring process easier. Vodka works well for hop compounds using a pipette or glass eye dropper to measure with.

You can make your own extract from fresh hops, but the isomerization of the alpha acids is greatly reduced if hops are boiled in water

as opposed to wort. A very bitter wort could be added late in fermentation provided that there was sufficient yeast present to finish the fermentation.

Mr. Wizard

Some of my favorite beers to brew are German hefeweizens. Up until now I have not kegged one,

mainly because I am afraid of losing the majority of the yeast through flocculation in the keg. I would not filter, but I wonder if you would have any suggestions concerning saving the integrity of the yeast? Is there a way to keep it in suspension so I can fully enjoy my wheat beers?

*Perry Colomb
via e-mail*



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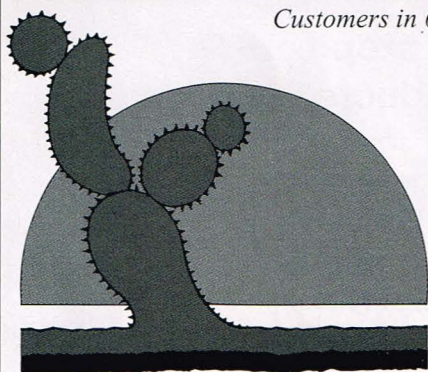


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Your concern is yeast flocculation, but many draught beer enthusiasts have a hard time dealing with the higher-than-normal carbonation level of weizen beers.

One of the easiest methods used for yeast flocculation is to store kegs of weizen upside down, a method typically used by brewers who distribute kegs of weizen and wish to avoid a glass of accidental "kritall" weizen. The basic concept of keeping the yeast in suspension works at home as well as in route from brewery to tavern. Giving your keg of weizen a healthy swirl every day or so will help keep the yeast from settling. Your beer may foam more than normal when dispensed immediately after the swirl treatment, but this will disappear much faster than the weizen will re-clarify.

Keep in mind is that most strains of weizen yeast are really not very flocculent. Many German weizen brewers remove poorly flocculating weizen yeast and add a well-flocculating lager yeast prior to packaging. If you keg your weizen with the fermenting strain, this concern should be less significant.

The other challenge is foaming. Pour some beer in your glass and wait for the foam to settle enough to allow more beer in the glass. Tap and repeat. The result should be a tall glass of cloudy weizen with a thick meringue of foam towering above the rim! ■

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

Mr. Wizard's Address

Do you have a question for Mr. Wizard? Write to him c/o *Brew Your Own*, 5053 Main Street, Suite A, Manchester Center, VT 05255. Or send e-mail to wiz@byo.com.

Beers for Brave Hearts

A Bavarian maibock and a strong Scotch ale

by Mikoli Weaver

It's Maibock time, with a new twist. Our second beer is also a treat — a strong Scotch ale.

Maibock: The Story

The original bockbier was a top-fermented dark beer made mostly of wheat. According to some records, bockbiers date as far back as 1250 AD. They were produced in winter and stored in ice caves for summer drinking. The name "bock" is from the town where it was first brewed: Einbeck, Germany.

Maibocks, also known as "helles bocks," are a pale variation of that original style. Like pilsners and other beers, these lighter bocks were made possible over time through improved grain processing, better brewing equipment and more sophisticated techniques. German Brewer's Guild law mandates maibocks be made with an original gravity between 16.5° to 17° Plato

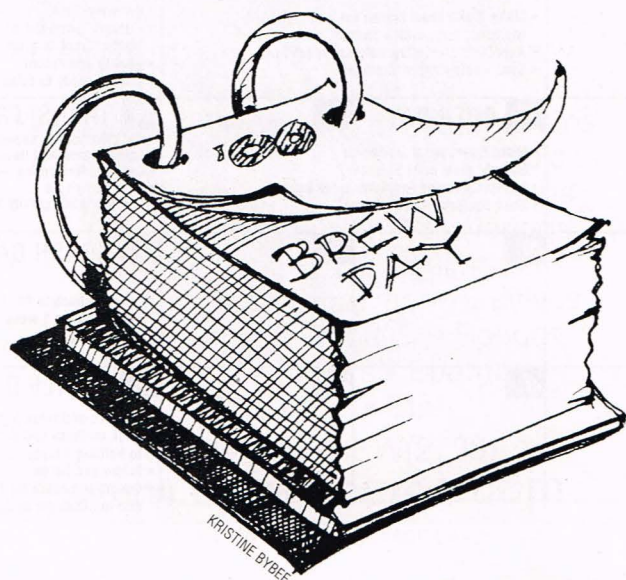
with an alcohol content of 6 to 7.5 percent by volume. The bitterness is moderate, from 20 IBUs to 35 IBUs. These beers are a light gold or light copper color, with a dry finish.

The old country offers dozens of great maibocks. A few examples available in our country are Ayinger Maibock, a floral, bright bock from Bavaria; Hacker-Pschorr Bock, a clean helles brewed with abundant Hallertau hops all the way through; and Einbecker Ur-Bock Hell, which is the original pale bockbier.

The U.S. microbrew movement also offers excellent maibocks. In fact, there could be a national festival just for all the great maibocks brewed by American micros. Some to try: Maierbock by Rogue Ales in Newport, Oregon; the pioneering bock made by Abita Brewing in Abita Springs, Louisiana; and Garten Brau by Capital Brewing in Madison, Wisconsin.

The maibock we're making this month will be lighter in color and possess a different finish than our previous deep-gold, malty brew (see "Style of the Month," April 1999).

For this and all other German styles, I'd recommend noble varieties of hops, and those of good German lineage for bittering. German Northern Brewer, Perle, Spalt and Spalt Select all make good



2000 Style Calendar

January: Barleywine and Roggenbier

A barleywine to age until the New Year's celebration and a flavorful German rye beer to balance out the dark season.

February: Cream Ale and Dublin Stout

This is black-and-tan brewing month. A light, slightly sweet cream ale and a traditional Irish stout for St. Patrick's Day.

March: Belgian Dubbel and Pilsner

Belgian Brewing 101 (a Chimay "Red Cap" clone) followed by Lager Brewing 101 (a traditional Czech pilsner).

April: Maibock and Scotch Strong Ale

Maibock, of course, for celebrating next month, and a bold, peated Scotch ale high in both gravity and flavor.

May: IPA and Mild Ale

An old standby—a highly hopped American-style IPA—and an English beer that's new to the lineup, a mild brown ale.

June: Golden Ale and Oktoberfest

A "lawnmower" beer for the start of summer. And a tasty Oktoberfest. It will be aged until early September.

September: Dortmunder and Oatmeal Stout

Dort is a light European export lager. Plus a new stout for this year's schedule — an English oatmeal.

October: ESB and Weizenbock

A deep amber, caramel-laden ESB and a gigantic German winter seasonal weizenbock to age until early January.

November: Bavarian Dunkel and Belgian Tripel

This month has two warming beers to fight the cold winter nights: a dark, chocolate dunkel and a high-gravity Belgian tripel.

December: Christmas Ale and Spiced Ale

A new version of our annual Christmas ale. Plus a lightly spiced dark ale with a distinctly festive edge to end the year.

bittering hops. Middle and finishing additions may include Hallertau, Czechoslovakian Saaz or Tettnang. Our recipe calls for Perle as the bittering hop at 90 minutes and Hallertau for 30 minutes at the end of the boil. Use hop flowers if they're available.

This recipe uses pale pilsner malt, along with a little light crystal 10° Lovibond malt for color and flavor. There's also a significant portion of malted wheat. This will make a nice full-bodied bock with a bit of residual richness. Our single-infusion mash will be performed at 150° F, for one hour or until the starch has converted to sugar.

My yeast selection is the Wyeast 2206 (Bavarian lager). More adventurous brewers can also get good results from Wyeast 2124 (Bohemian lager) and Wyeast 2308 (Munich lager). The fermentation is a two-week step process followed by a week of settling at 40° F and

aging in the bottle for at least four weeks at 40° F.

Maibock (5 gallons, all-grain)

Ingredients:

- 8 lbs. Pale pilsner malt
- 3 lbs. Pale malted wheat
- 1 lb. crystal malt, 10° Lovibond
- 0.75 oz. Perle (7.3% alpha acid, 7.3 AAUs) for 90 minutes
- 0.50 oz. Hallertau (3.5% alpha acid, 1.75 AAUs) for 30 minutes
- 1 oz. Hallertau (3.5% alpha acid, 3.5 AAUs) at end of boil
- 2 pt. starter of Wyeast 2206 (Bavarian lager)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 3.75 gal. of water at 150° F for 60 min. Sparge with 168° to 170° F water to collect 5.75 gal. of wort. Total boil is 90 min.

At beginning of boil add Perle

hops and boil 60 min. Add 0.50 Hallertau, boil remaining 30 min. At end of boil, add 1 oz. Hallertau to finish. Whirlpool and cool to 45° F to pitch starter. Oxygenate-aerate.

Ferment at 45° F for three days, raise to 55° over four more days then rack to secondary. Continue fermentation for seven more days until gravity is 1.012 (3° Plato). Cool to 40° F or below and let settle for seven more days. Prime and bottle. Age at least four more weeks at 40° F before drinking.

OG = 1.068 (17° Plato)

Bitterness = 30 IBUs

Color = 10 SRM

7.5% ABV

Extract with Grain Option:

Substitute 9.5 lbs. pale malt extract, preferably containing some wheat malt. Start with 5 gal. of 150° F water. Steep crushed grain for 30 min. Sparge grains with enough 170° F water to make 5.5 gal. Heat

Brewing Calendar April 2000

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 BOTTLE DAY • Sanitize and rinse bottles • Rack dubbel to bottling vessel • Check and record final gravity • Prime and bottle dubbel
2	3	4	5	6 PREP DAY • Make 2 pint yeast starter for maibock, grow until Saturday • Assemble recipe ingredients for maibock • Soak equipment in sanitizer	7	8 BREW DAY • Brew maibock • Primary fermentation starts, check original gravity and record • Dubbel ready to drink
9	10	11	12	13 PREP DAY • Make 2 pint yeast starter for Scotch, grow until Saturday • Assemble recipe ingredients for Scotch • Soak equipment in sanitizer	14	15 TRANSFER/BREW • Rack maibock to secondary • Check gravity and flavor • Continue fermenting for 2 weeks • Brew Scotch ale • Check original gravity and record
16	17	18	19	20	21	22 CRASH DAY • Cool maibock to 40° F and settle for 1 week
23	24	25	26	27	28	29 BOTTLE DAY • Sanitize and rinse bottles • Rack maibock and Scotch to bottling vessel • Prime and bottle • Condition Scotch for 1 week and maibock for at least 4 weeks
30						

to boiling and add extract syrup. The total boil will be 60 min. At beginning of boil add 1 oz. Perle, continue for 30 min. Add 0.50 oz Hallertau. Boil for 30 more min., add 1 oz. Hallertau and whirlpool. Cool to 45° F and pitch starter. Oxygenate-aerate well. Follow fermentation schedule from above.

OG = 1.068 (17° Plato)
Bitterness = 30 IBUs 30
Color = 15 SRMs
7.5% ABV

Scotch Strong Ale: The Story

Over the ages, the country of Scotland has been known for many things: proud clans, powerful warriors and some of the best malt beverages ever created.

Skullsplitter is the model for this month's beer, brewed by Orkney, named for the small chain of islands off the northern tip of Scotland. The Orkneys were home to a certain Thorfinn Hausakluif (his last name

means "skullsplitter"), the Seventh Earl of Orkney, who ruled about 950 AD. The beer is very alcoholic and estery, with a dark, malty finish.

Another Scotch ale to try is Traquair House Ale, brewed since 1491. Its companion ale is Traquair Jacobite, a version spiced with coriander and named for the Jacobite revolution. These beers have an OG of 1.080 (20° Plato) and finish slightly sweet with lots of malt and alcohol.

The third example is a refreshing change because it's brewed in Belgium. In fact, the Scottish style in general is pretty popular in Belgium. In 1919 a law was passed that prohibited distilled spirits from being served in cafes and restaurants. Strong ales and lagers benefited greatly from this prohibition and started a trend that continues today. It is the Belgians, always attentive to the type of glassware used when drinking, who first start-

ed using the thistle glass for Scotch ale. The Silly Brewery's Silly Scotch is 8 percent alcohol by volume and is an incredible ale brewed using traditional ingredients.

From the United States, among many examples, you might try Kilt Lifter from Pike Place Brewery in Seattle, made with a small percentage of peated malt; or the 1999 gold-medal winner at the Great American Beer Festival: Mac Spootin from the Back Bay Brewing Company in Boston.

This beer will be similar to our Scottish ale last year, but have much more of everything. It will have an original gravity of 1.080 (20° Plato) and a terminal gravity of 1.012 (3° Plato). It's a strong beer to say the least, and very malty. The alcohol content will be about 8.67 percent by volume.

The grain bill is composed of marris otter pale, crystal 40° Lovibond and chocolate malt. I had



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Brewing Schedule Notes

April 1, Saturday: Bottle Day

Sanitize bottles. Rack dubbel brewed in March. Record final gravity. Prime and bottle.

April 6, Thursday: Prep Day

Make 2 pint yeast starter for maibock, gather recipe ingredients. Soak equipment in sanitizer.

April 8, Saturday: Brew Day

Brew maibock. Primary fermentation starts. Check original gravity and record. Dubbel ready.

April 13, Thursday: Prep Day

Make 2 pint yeast starter for Scotch, grow until Saturday. Gather recipe ingredients. Soak equipment in sanitizer.

April 15, Saturday: Brew Day

Rack maibock to secondary. Check gravity and flavor for progress. Continue fermenting for 2 more weeks. Brew Scotch ale, record original gravity.

April 22, Saturday: Crash Day

Cool maibock to 40° F and allow to settle for 1 week.

April 29, Saturday: Bottle Day

Sanitize and rinse bottles, rack maibock and Scotch to bottling vessel. Check and record final gravity for both. Prime and bottle. Condition Scotch for 1 week and maibock for at least 4.

May brews: IPA and mild ale.

originally planned to use a grain bill based on Brewing Products Limited malts, a company that began malting for the distilling industry in Scotland. They aren't always easy to find, but if you can track them down, use the Scotmalt 1, a golden promise pale (in place of the marris otter), Scotmalt 8 (instead of the crystal) and Scotmalt 11 (for the chocolate malt). Extract brewers can also take advantage of these products by using Scotmalt CR130, a dark extract made from the pale and crystal malts mentioned above.

Scottish ales are often mashed from 153° to 156° F, at higher temperatures than you see me use here. The recipe calls for a mash of 150° F to get the most from your alpha and beta activity.

Hop choices for Scottish styles are pretty simple. In the October issue, our "80 Shilling Ale" employed Fuggle and Kent Goldings. This beer requires a bit more hop



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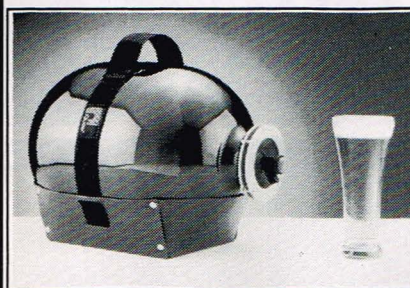
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presence for balance and will be bittered with English Bullion, then finished with Kent Goldings.

Wyeast 1728 (Scottish Ale) will provide authentic yeast character to the beer, and if provided with enough oxygen at pitching time, will have no problem attenuating the beer to 3 or 4 percent sugar.

Scotch Strong Ale (5 gallons, all-grain)

Ingredients:

- 12 lbs. marris otter
- 1 lb. carapils or dextrin-type malt
- 1.5 lb. crystal, 40° Lovibond
- 0.25 lb. chocolate malt
- 1 oz. Bullion (8.0% alpha acid, 8 AAUs) for 90 minutes
- 0.5 oz. Kent Goldings (5.4% alpha acid, 2.7 AAUs) for 30 minutes
- 1 oz. Kent Goldings (5.4% alpha acids, 2.7 AAUs) at end of boil
- 2 pt. starter of Wyeast 1728 (Scottish Ale)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 4.5 gal. of water at 150° F for 60 minutes. Sparge with 168° to 170° F water to collect 5.75 gallons of wort. Total boil time is 90 minutes.

At beginning of boil add 1 oz. Bullion and boil 60 minutes. Add 0.5 oz. Goldings, boil remaining 30 minutes. At end of boil, add 1 oz. Kent Goldings to finish. Whirlpool and cool to 67° F to pitch starter. Oxygenate-aerate well.

Ferment at 67° F for seven days then rack to secondary fermenter. Continue fermentation for 14 more days until gravity is about 1.012 (3° Plato) or fermentation is finished. Let settle, rack, prime and bottle. Allow to age seven more days before drinking.

OG = 1.080 (20° Plato)
Bitterness = 35 IBUs
Color = 37 SRM
8.67% ABV

Extract with Grain Option:

Substitute 10 lbs. pale malt extract for marris otter. Start with 5

gal. of 150° F water. Sparge grains with enough 170° F water to make 5.5 gallons. Heat to boiling and add extract syrup. The total boil time will be 60 min. At beginning of the boil add Bullion hops and boil for 30 min. Add the first Kent Goldings, then boil 30 additional min. and then add the last Kent Goldings to finish off the beer. Whirlpool and cool to 67° F to pitch the starter

yeast. Be sure to oxygenate-aerate well. Follow fermentation schedule as detailed from above.

OG = 1.080 (20° Plato)
Bitterness = 35 IBUs
Color = 37 SRM
8.67% ABV ■

Mikoli Weaver lives in Portland, Oregon. He also wrote "Three Hard Beers Made Easy" in this issue.

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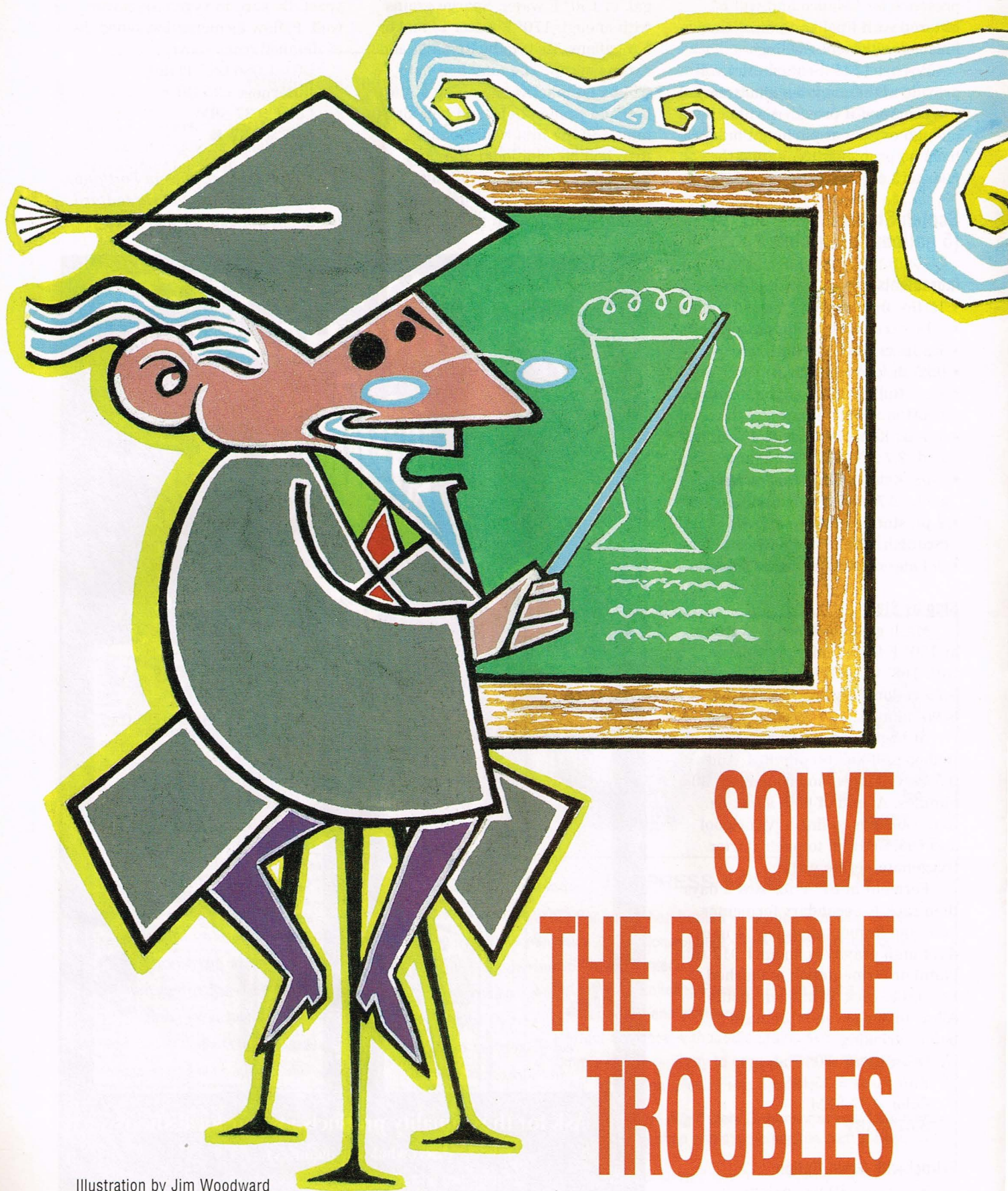
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SOLVE THE BUBBLE TROUBLES

Ten tips for a better boil

Illustration by Jim Woodward



Regardless of whether you consider homebrew a scientific creation, a mystic potion or something in between, you can't ignore the importance of a vigorous boil. While many Prohibition-era recipes made little mention of boiling the wort, in modern brewing a solid boil is considered vital to even the simplest homebrew recipes.

Why Boil?

There are many reasons wort should undergo a vigorous boil. They include sanitation, clarity, yeast health, hop utilization and vaporization of volatile compounds. There are many other reasons, but these will have the most dramatic effect on finished beer.

Volumes have been written on the importance of rigorous sanitation. It's all true: A fanatical cleaning regimen and the proper use of sanitizing compounds can ensure that your brewing equipment won't harbor beer-spoiling bacteria. But the actual ingredients, like grain and hops, can't be sterilized. Even the trace amounts of chlorine used to purify our drinking water can have a horrible effect on the flavor.

Fortunately, Louis Pasteur discovered long ago that many forms of bacteria are rendered harmless through exposure to heat and pressure. Most of the bacteria that are capable of spoiling beer wort fall into this group. A solid boil of at least one hour will ensure that any bacteria or wild yeasts introduced by the ingredients used in the beer — such as the water, malt extract or hops — will be incapable of spoiling the wort and allow the yeast to perform its magic. Even cans of malt extract that have a “no-boil” recipe should undergo at least a 30-minute boil to destroy any wild yeast or bacteria.

It may seem odd to think that boiling can affect a beer's clarity, until you look at the sources of haze and cloudiness. Many hazes are the result of proteins that are present in the finished beer. These proteins react with other compounds under changes in temperature or other conditions.

The most well-known example is “chill-haze.” This is when a beer that's crystal-clear at room temperatures becomes cloudy after it is chilled. Why? Because microscopic protein compounds are coagulating and interacting with other compounds, called tannins. While these compounds are present in most finished beer, minimizing their presence will also minimize the resulting haze. With a vigorous boil, these proteins will coagulate and form big clumps that can be seen rolling around in the boil. By allowing the clumps to settle out at the end of the boil, excessive protein that might show up in the finished beer can be kept back in the brewpot when you rack into the fermenter.

Excessive protein in the finished beer can also have a detrimental effect on the yeast, before and during fermentation. While some protein is necessary for

by John Oliver

yeast health and head retention, large amounts of trub that result from protein coagulation are best left behind in the kettle.

Hop utilization — in the form of bitterness, flavor and aroma — is directly tied to the intensity and length of the boil.

The alpha acids responsible for hop bitterness need to undergo "isomerization." This is the process during which insoluble compounds in hops — the compounds responsible for bittering — become soluble in water through exposure to the heat of the boil.

This is why hops thrown in at the beginning of a sixty-minute boil provide the bulk of the bittering. Other compounds in the hops, the ones that provide flavor and aroma, tend to be delicate and volatile, and are easily driven off during an extended boil. Flavoring and aroma hops are usually added when there is less than 30 minutes left in the boil. Dry hops that are introduced into the fermenter at cool temperatures add little or no bitterness to the finished beer, yet impart many aromatic and flavor notes.

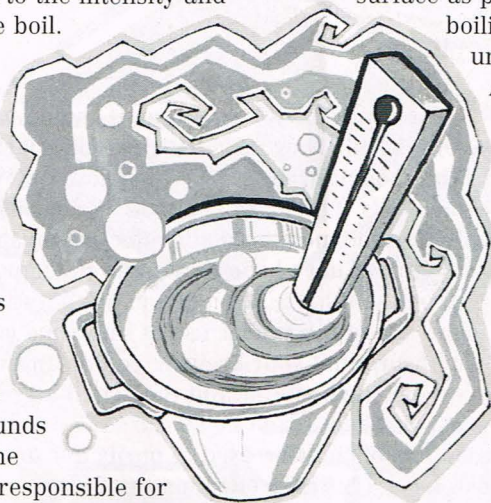
Just as the delicate and desirable aromatic compounds in hops are driven off during an extended boil, undesirable volatile aromatics — such as sulfur compounds in malt and malt extract — are easily driven off as well. One of the most well-known is dimethyl sulfide, a compound that if allowed to remain in the beer will result in a distinct aroma and flavor of creamed corn.

Another example of a volatile aromatic compound is the mild odor of chlorine from many domestic water supplies. A brief boil of only a few minutes, before the brewing process even begins, is usually all that's necessary to drive off any

noticeable traces of chlorine.

A good boil should cause a strong convective current in the brewpot, with the bubbles rushing to the outside edge and then dropping down. As much of the beer's surface as possible should be boiling, with a steady volume of escaping steam.

A light boil or simmering boil, in which only the small bubbles make their way to the surface, will not achieve much. With all that in mind, here are ten tips for achieving a better boil.



1. Boil all the wort

If possible, boil the full volume of wort. This will assure three things. First, all the water and ingredients will have undergone a sufficient boil to ensure sanitation. Second, the additional wort volume will reduce the density of the sugars in solution. Third, it will help with the isomerization and utilization of hop compounds.

Many homebrewers don't have a kettle big enough to hold the full volume of wort. Instead, they boil all of the ingredients in a portion of the liquid, then use sanitary water to top up the fermenter to the final batch size. When the ingredients are boiled in a small volume — say, 2.5 gallons of boiling liquid for what will become a 5-gallon batch — the density of the wort is higher due to the increased concentration of sugars. This will have a detrimental effect on the vigor of the boil. It will also reduce hop utilization.

2. Leave the lid off

When the lid is on the kettle, the heat will be more concentrated. This could cause a dreaded boilover! If you leave the lid on, the only way to compensate for the extra heat is by reducing the volume of wort in the kettle. And as we said in the first tip, the more wort

you can boil, the better.

By leaving the lid off, the heat in the headspace of the kettle is reduced. This reduces the foam and allows a larger volume of liquid in the kettle, making the kettle "bigger" in a sense.

Even brewers lucky enough to own a huge kettle should keep the lid off. Why? Because the volatile compounds that should be driven off in the steam during a boil will end up condensing on the lid and dropping right back down into the wort!

3. Use purified water to top off

While a full-wort boil is nice, many of us do not have the large kettle or burner needed to bring five gallons of wort to a vigorous boil. We have to settle for boiling a portion of the wort, then adding top-up water to the fermenter. Excellent beer can be made this way, as long as you keep in mind that the top-up water may not be sanitary or might contain volatile compounds such as chlorine or oxygen. To avoid introducing any unwanted bacteria or compounds, take time the night before a brew session to boil the top-up water. Or you can buy purified water.

When boiling the night before, keep in mind that as the water cools it will pull a vacuum. Store the water in a flexible plastic container with a minimal amount of headspace and a lid that seals.

4. Allow boiled wort to settle

Boiling will make haze-causing proteins coagulate into larger clumps. By allowing the wort to settle after boiling, these particles will precipitate to the bottom of the kettle, leaving clear wort on top. Usually this takes about 10 minutes. If you leave the lid on during this time, the wort will remain hot enough to prevent any unwanted microorganisms from gaining a foothold before you pitch the yeast.

Kettle coagulants and fining agents, such as Irish moss, introduced at the end of the boil will help precipitate the proteins during

this settling period. If you use an immersion-style wort chiller, the rapid chilling will also help speed the settling of protein particles into a “trub pile” in the bottom of the kettle. When transferring to the fermenter, leave as much of this trub behind as possible. This will give you healthier fermentation and clearer beer. Another tip: Stirring a long-handled spoon around the outer edge of the kettle will create a whirlpool. The material will collect in the center of the pot bottom. Siphon off around the pile.

5. When adding malt extract, turn off the heat

Because it's very dense, malt extract syrup will often clump and sink to the bottom of the kettle when it's added. If the kettle is still over a heat source, the heavier syrup might stick and burn on the bottom. This will give the finished beer a burnt flavor. Dry malt extract powder has a similar tendency to clump and form a crust at the top of the kettle. This will result in an instantaneous (and messy) boilover.

Regardless of which type of extract you're using, bring the kettle to a near boil and then remove it from the heat. Slowly add the malt extract and stir, not allowing clumps to sink to the bottom or form on the surface. Once all of the extract is evenly dissolved in the near-boiling water, return the kettle to the heat source and resume heating.

6. Soap down kettles when using outdoor cookers

Mega-BTU outdoor cookers are a great way to bring large volumes of wort to a boil. Unfortunately, these same burners can create a heavy layer of soot across the bottom of the kettle. This stuff can be extremely difficult to remove, yet seems to get smudged everywhere.

The solution is simple: Before you start the boil, take a bottle of liquid dish soap and put a light layer on the outside of the kettle. Don't be alarmed by the layers of soot. Afterwards they'll be consider-

ably easier to remove using soap, hot water and a scrubby pad.

7. Easy does it.

Just because you have 200,000 BTUs of energy doesn't mean you should run that Rocket-Engine Super-Burner at full throttle. Once a boil is achieved, use only enough heat to maintain a vigorous boil. Excessive heat will result in greater evaporation rates, caramelization and burning of sugar on the bottom of the kettle, and a tendency for the wort to boil over at any time. Plus, you'll waste fuel.

If you see flames curling around the brewpot — to the point where the bottom is glowing and it looks like a space capsule on reentry — a lot of heat energy is being wasted and going directly up the sides. This can result in injury the first time you grab the handles of the pot, even when wearing oven mitts.

Needless to say, ball valves near the bottom of the kettle or thermometer units on the side will not last very long when subjected to these conditions. A metal deflector plate, set under the pot, can help prevent their meltdown without a decrease in boil performance.

8. Insulate burner elements

For brewers limited to boiling small batches on electric stovetops, there's a tendency for the part of the kettle that's in direct contact with the burner to be substantially hotter. It's not uncommon to find a spiral of burnt sugar on the bottom even with a mild boil. This can be minimized by placing a trivet (fashioned out of heavy wire or rods) or a heat plate (made of thick metal) between the burner and the kettle.

Although heat transfer will be somewhat reduced, it will allow for a more even application of heat across the bottom of the kettle and reduce the chance of scorching.

9. Keep a spray bottle handy

A major contributing factor to boilovers is a process known as the

“hot break.” As temperatures come up, the proteins coagulate, and this is called the hot break.

The hot break happens in both extract and all-grain brewing, and it's easy to identify when it occurs: The coagulating proteins contribute to a thick head of foam that will try to climb out of the kettle and make a huge mess on the stove. After a few minutes, as the boil proceeds, these proteins will begin to break down and clump together to form larger chunks of protein that can be seen in the wort.

Until this happens, you can do several things to keep the foam in the kettle and off your stovetop. Stirring will help accelerate the breakdown of the head, and throttling the heat down slightly may also help maintain control. It is important not to let the entire boil subside, because when the kettle returns to a boil, the hot break may happen all over again.

It can also be helpful to keep a little spray bottle of clean water close at hand. Lightly mist the foamy surface of the boiling wort. This slight cooling of the protein-rich foam can help speed up the coagulation process.

10. Begin adding hops after the hot break

Unless you are “first-wort hopping,” a brewing technique in which hops are added to the kettle at the beginning of the lautering, then you should allow the hot break to subside and the boil to stabilize before you add hops.

Adding the hops sooner can often accelerate the boilover process, so be prepared to lower the heat quickly or stir right after the first hop addition. Boilovers usually shouldn't be a problem with subsequent hop additions. ■

John Oliver is a BJCP National Judge who maintains good wort-boiling practices as head brewer for BJ's Brewery in Brea, California. His most recent article for BYO was “Practice With Your Palate” in the March issue.

HOT TIPS!

For Making Great Smoked Beers At Home

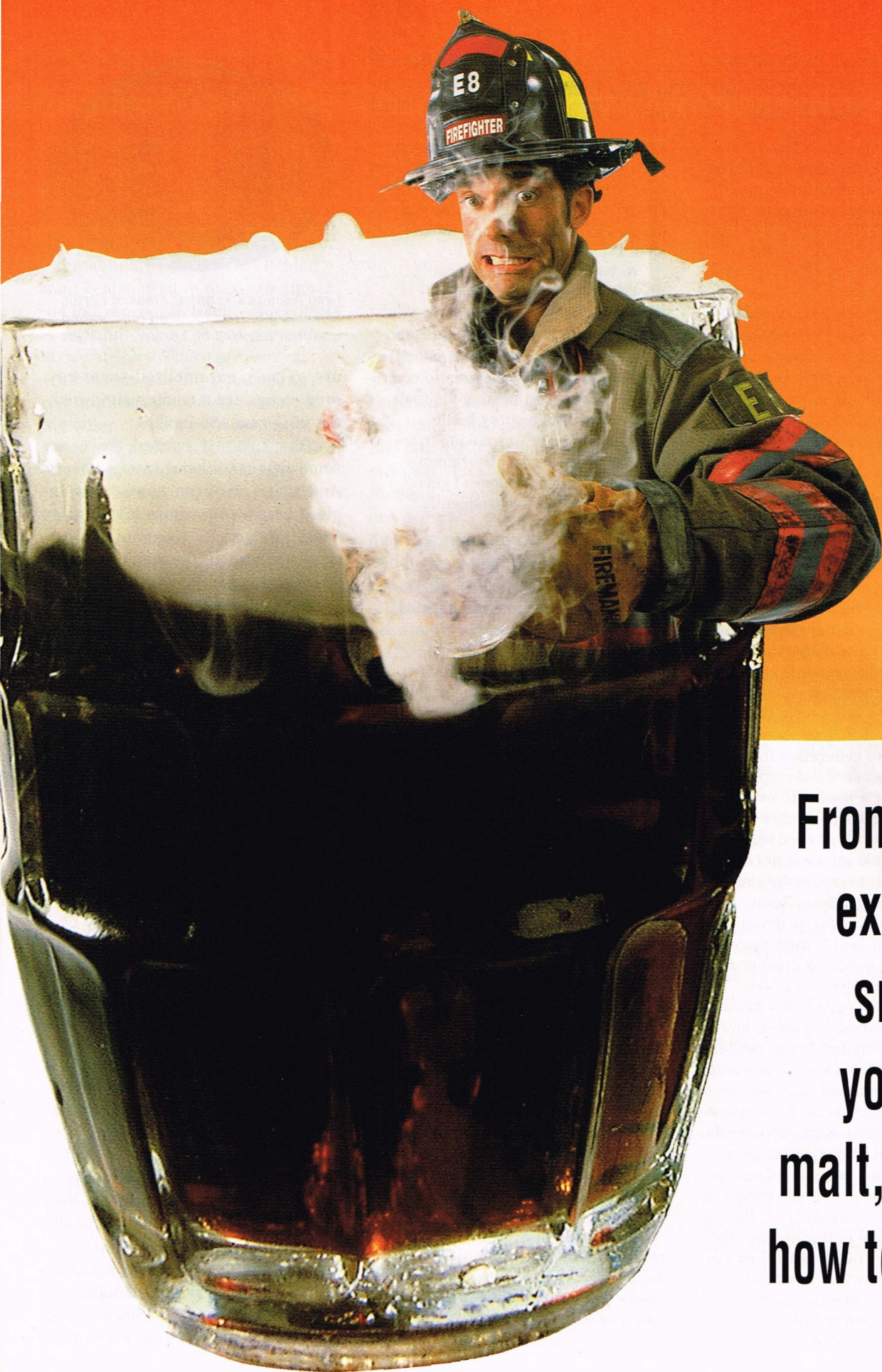
The history of beer and brewing is full of happy accidents. Fermentation itself probably first happened because of sloppy housekeeping — some primitive gatherer of grains left some in a wet place, they sprouted and dried out and got wet again, leaving behind a puddle of fragrant grain juice which, when sampled, produced a pleasant feeling.

This accident was surely repeated in several places, in varying circumstances, until a less primitive person realized that the conditions of the accident could be reproduced and controlled. The slowness of the drying stage was replaced by “artificial” drying, over a fire. The malted grains took on the fla-

vor of the smoke from the heat source — wood, usually, but in some places peat, bone, even dung. (Thankfully, no dung-smoked beers remain with us today.) Smoke-dried grains are the basis for German rauchbiers, Scots whiskey and several other “indigenous” beverages, and, in recent years, they have seen a new popularity as a specialty flavor in the craft-brewing renaissance.

When brewers began to boil the sweet grain juice before allowing it to ferment, another serendipitous discovery must have taken place: Heated stones were added to the kettle rather than heat being applied externally, causing a caramelization of the grain sug-

by Scott Russell



**From using
extract to
smoking
your own
malt, here's
how to do it.**

Hot Tips for Smoking Your Own Malt

Greg Noonan, Vermont Pub & Brewery

A decade ago, Geoff and Marci Larson's excellent Alaskan Smoked Porter inspired us at the Vermont Pub & Brewery to brew what we thought was going to be a one-time batch of The Vermont Smoked Porter. Ten years later, we're still brewing it as a "regular" brand.

Over those ten years we've learned a few things about smoking malt that might help home-smoking homebrewers. Here are ten Vermont Pub & Brewery tips:

1. Any outdoor smoker, grill or hibachi will suffice as a smoker, as long as it has a cover to create the smoke-laden "smudge," and a pan that can hold wood chips fitted over the heat source (although wet wood chips tossed into well-burned charcoal works too).

2. High temperatures are not necessary for smoking malt. For one thing, hot malt doesn't seem to absorb smokiness better than warm malt. Moreover, smoke is produced by partial combustion — too high a heat produces less smoke than a moderate heat. It is far easier to control smoke generation from lightly dampened wood chips piled in a pan over a medium-low flame than it is to generate smoke from heavily wetted chips over high heat.

3. All wood smoke is not equal. What you use to create the smoke ("smudge") also affects flavor. Hickory smoke is sharp, dry and phenolic, and peat is even more so. Mesquite is sharp and quite distinctive. Oak is intense and woody. Maple gives a sausage-like flavor. Fruit woods infuse a gentler, more generically "smoky" flavor, similar to beechwood, but even less phenolic. Of the common fruitwoods we have tried, apple is mild and pleasant, while cherry is distinctively flavored. Liquid smoke makes beer that tastes like, well, liquid smoke.

4. Wood isn't the only thing that you can use for smoking. At the Five Spice Café in Burlington, chef-owner Gerry Weinberg uses rice in the bottom of a wok to smoke salmon! Corn cobs are used to smoke hams at a half-dozen

Vermont smokehouses. If it burns, it can be used to generate smoke!

5. Heavily smoking a small portion of the grain bill is quicker and more efficient than lightly smoking all of the malt.

6. Wet malt absorbs more smoke character than dry malt. However, wet malt is a milling nightmare, so if it's wetted, it needs to be dried out again before milling. We have solved this dilemma to our satisfaction by just misting the malt with water from a spray bottle immediately prior to smoking it, so that the damp husks absorb more smoke, but the malt doesn't get deeply wetted and consequently dries quickly.

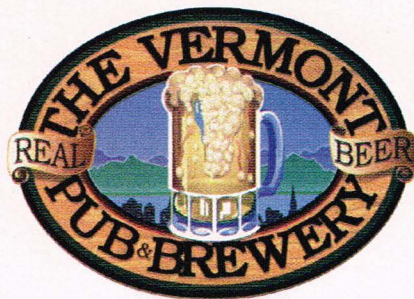
7. Lightly-wetted crystal and caramel malts absorb more smoke than damp pale or lager malts. The caramelized malts are saccharified, and those sugars are sticky when wet. Consequently, the caramel malts absorb smoke more efficiently. ("Saccharification" is the process through which malt starch is converted into fermentable sugars.)

8. Rolled oats and other gelatinous grains absorb more smoke character than the denser and less porous barley malts do.

9. Wet malt is a nightmare to mill. It doesn't crack, it squishes. It gums up the mill and doesn't disperse well in the mash. Dry the smoked malt well by heating it uncovered until it is crispy rather than gummy, then spread it out in a shallow layer to evaporate more water off as it cools.

10. Hot malt heaped into a container can start its own "smudge." We've had smoked malt that was put into a bucket while too hot start its own smoldering fire, which then burst into flames. Avoid starting a homebrewery fire; let the smoked malt cool to room temperature before putting it in a container.

Greg Noonan is brewmaster at the Vermont Pub & Brewery in Burlington, Vermont. His Smoked Porter won gold at the 1991 GABF and a variety of other competitions.



Greg Noonan's Vermont Smoked Porter, legendary in New England and beyond, was first inspired by Larson's Alaskan.

ars. These caramelized-sugar-covered stones are a traditional ingredient of German Steinbiers.

As explained earlier, there are some true traditional smoked beers. And there are even more "newfangled" brews with smoke added as an exotic flavor. In Germany, in the Bamberg region, the rauchbier is as much a way of life as the pale ale is in England. Rauchbiers are moderately strong and ruddy-amber, with a smokiness that can be subtle, supporting but not overwhelming the rest of the beer. Many rauchbiers are brewed almost entirely with smoked grains — as much as 95% of the total grain bill — but some brewers in Bamberg use the rauch malt in smaller doses as a special ingredient. The beers are basically a Vienna or Festbier style, behind the smoke.

In the same region, other brewers use super-hot porous stones to actually boil the wort. The beer caramelizes on and in the stones, and these stones are later added back into the fermenting wort. This process creates a sweet, burnt flavor in what is known as Steinbier. Here in the United States, the Frederick Brewing Company in Maryland won a 1998 GABF bronze medal in the "Experimental" Category for its Brimstone Stone Beer. Head brewer Tim Keck says he boils as normal in his kettle, then knocks out 250 gallons into a smaller vessel and lowers hot rocks into the liquid. This produces a vigorous boil and adds a nice burnt-toffee, caramelized flavor to the beer.

While many of us associate a

peat-smoke aroma and flavor with Scottish ales, in fact, they were never traditionally brewed to be smoky. They usually do include a bit of roasted barley for color, but the legend of peated malt, or whiskey malt, is probably a modern one. Nevertheless, it works. Boston Brewing Company makes a version, Samuel Adams Scotch Ale. Peated malt is also used to make an amber ale in France, Adelscott, which really does not belong to any particular style category. There are several craft brewers in the U.S. making non-traditional smoked beers, taking other classic or not-so-classic styles and adding a touch of smoke. There's probably one near you!

So how do you get that smoky flavor into your beer, whatever the style or recipe you want to try? There are essentially two types of ingredients for the homebrewer, and a third possibility in an advanced technique.

Extracts and Liquid Smoke

Someone who brews exclusively from extracts can try to achieve the smokiness by adding a barbecue smoke flavoring. A big caution here, though — many of the commercial “liquid smoke” flavorings contain other things, most notably vinegar. This is OK if you are making, say, a smoked lambic, but vinegar does not go well in other beer styles.

So read the ingredient list very carefully. Don't use the brands with pepper or other spices, unless that is an additional flavor you desire.

I don't know what brands might be available in your area, so it's tough to make a recommendation. Go to your grocery store and look for yourself. A few years ago, I tried making a smoked beer with Wright's brand liquid smoke. To be honest, I didn't like the way it came out. It tasted too bitter, charcoal-like and artificial.

If you choose to go this route, liquid smoke should be added after the boiled wort begins to cool down, just before you pitch the yeast.

Depending on your taste and the strength and concentration of the liquid smoke, 1/4 teaspoon to 1-1/2 teaspoons may do the trick.

Err on the side of caution.

Smoke is an overwhelming flavor, easily overdone, easily misjudged.

Brewing with Smoked Grains

Many brewers will undoubtedly prefer to use one of the several types of smoked grains now fairly easily obtained from homebrew shops and suppliers. The two most common (and useful) are a German lager malt, smoked over beechwood and labeled “rauchmalt,” and various peat-smoked pale malts from England, Scotland and the U.S. They are generally milder than expected, due to storage and aging, no doubt, and it takes a lot of them to really drastically alter the flavor of a beer.

Nevertheless, it wouldn't do to brew a beer that was all smoke and no flavor. The smoke flavor of the two malts is decidedly different and they are not interchangeable. The peated malt is fine for big, rich malty ales (Scotch ales, barley wines, old ales for example), as it imparts a tangy, salty flavor that would be out of balance and out of character for more subtly flavored beers. This is the type of malted barley used in Scots and Irish whiskeys, of course, and those knowledgeable about single-malt whiskeys will know the type of flavor I'm describing. The rauchmalt, on the other hand, gives a smoother, less obvious smokiness, and is a perfect complement to hops, moderate malt sweetness and the crisp clean flavor profile of most lagers.

Using these grains is much like using any specialty grains — if you only steep from a few ounces to a pound or two of grain to add character to your otherwise extract-based brew, that would be the place to play with a modest quantity of smoked malt. If you use a partial mash, try substituting a pound of peated or rauchmalt for a pound of pale or lager malt. All-grain brew-

ers would do the same thing, probably limiting the smoked malt to no more than 20 percent of the grain bill in the mash.

Smoking Your Own Grains

If you want to do it all by yourself — start from as close to scratch as possible, or customize your recipe in terms of which kind of smoke flavor — there is only one solution: smoke your own grains.

The two best examples of “new” smoked beers in the United States are similar in two ways: Both are smoked porters, and both use custom-smoked malts. Alaskan Brewing smokes theirs over alder wood, the Vermont Pub & Brewery over maple and apple (for smoked-beer tips from these well-known brewers, see the “Hot Tips” side-bars). The results are noticeably different, but both have a distinct woody character along with the smoke itself. Using these grains is no different from using commercially made smoked grains, but the process involves the added step of doing the smoking yourself.

Generally, the best woods to use are hard woods, particularly fruit and nut trees. Alder is the traditional smoking wood of the Pacific Northwest, used for fish and game. New Englanders are likely to use regional woods like maple, apple and cherry. Oak would impart a nice oaky, barrel-ish flavor (Scots whiskeys and ports and sherries are often aged in oak; the vats are “cleaned” by burning out the insides). You could even try mesquite, for a southwestern flavor. Many classic smoking hardwoods are available as chips; you don't need to sharpen the axe.

Whatever wood you choose, you can use a commercial patio smoker (as used for barbecue, jerky and the like), or even a simple hibachi or kettle grill. Get a fire going using the wood of your choice. If it's a little wet, it will produce more smoke than if dry. This is good: The idea is to make smoke, not fire. Scorched

Hot Tips for Making Smoked Beers

Geoff Larson, Alaskan Brewing Company

A century ago, almost all beers had smoke characteristics that came from the malting process. Today, we find smoked beers around the country that are flavored by a variety of local hardwoods. The Association of Brewers has another "classic beer styles series" book coming out this fall about smoked beers written by Ray Daniels and me — there is a lot of history surrounding smoke and its flavor expression in beer that I'm interested in sharing. I have had a lot of fun doing the research and I'm not "blowing smoke" about that.

I hope you will take the time to experiment with smoking malt for your beers. Below are some tips to get you started. And I'd love to hear about what you do! The wonderful thing about the flavor component of smoke is that everyone is familiar with it, but not necessarily as an ingredient in beer. You can help rediscover this unique flavor!

1. Use de-chlorinated water. Distilled is best, as many municipalities use sodium hypochlorite in the water supply. This chlorine salt cannot be removed by boiling or using activated carbon. Chlorine ions react with the good-tasting phenols in the smoke, giving the beer a medicinal taste. You will still need to add the appropriate minerals for the style you are brewing.

2. Use any wood that is appropriate for smoking food. Except pine! Be aware that you will have flavor associations with certain foods. Many people associate hickory with ham, or maple with sausage, and people will identify it with your beer so keep that in mind. Apple is a nice mellow wood to try your first time out. Once you are comfortable with smoking malt, be inventive. What local smoke source is from your area? Corn cobs? Orange trees?

3. Use a cool fire. Coals without flames and damp (moistened) wood chips should keep it cool enough. Also try to protect the malt from any fly ash. It is low-temperature

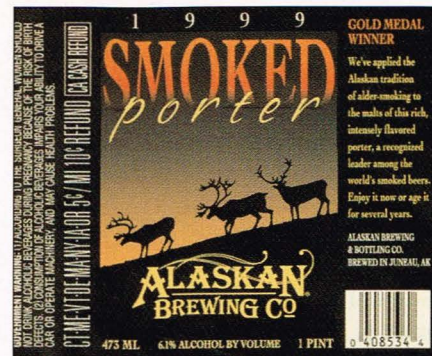
combustion that makes smoke and you can use your backyard barbecue for the process. Temperatures over 1700° F produce nitrogen-free radicals that react with the protein in the malt, causing compounds that are classified as carcinogens. These compounds, also called nitrosamines, are not good for you. (These issues apply to all grilled foods and this is why grilling is generally considered not to be healthy. I still love grilled food anyway.)

Commercially, we use low temperatures for smoke generation to prevent nitrogen-free radicals from being formed.

4. Smoke enough malt to do several batches. Moisten the malt slightly and make sure it is dry for storage after smoking. If after smoking it is still damp, dry it in the oven at a very low temperature with the oven door open; 200° F is fine but cooler is better.

5. Use smoked malt sparingly the first few times. The beer's carbonation will release more aromatics and flavor when you taste the beer on a fresh palate. The smoke flavors and aromas are very powerful but also tend to blind your palate. The first time you brew, use less smoked malt than you think will be necessary. I would suggest 5 percent to 10 percent. If after the first batch of beer you feel you don't have enough smoked flavor, add more smoked malt the next batch. Keep in mind that once you've tasted the malt you will have temporarily saturated your palate and will start to think you don't have much flavor in it, do not fall into that trap. Even if you did use too little smoked malt, it adds a welcome complexity — you still have a nice beer, so sit back, relax and enjoy your homebrew.

Geoff Larson is founder of the Alaskan Brewing Company in Douglas, Alaska. His beers, including the Alaskan Smoked Porter, have won gold and silver medals at the Great American Beer Festival.



The beer that made Geoff Larson famous (or one of them, anyway). His Smoked Porter has won many GABF medals.

grain is not smoked grain!

Spread the desired amount of malt on a metal screen (such as an old window screen) and place over the smoke, but not over the fire itself. It will be tricky the first time to find the balance — you need to keep the fire going, but it can't get too hot, or come into direct contact with the grain, or you'll wind up with charcoal instead of smoked malt. Spritz the malt occasionally with water, gently turn it with a wide metal spatula at the half-way point, close the cover if your grill has one. Five to ten minutes will be enough for a mildly smoky flavor, twenty to thirty would be the maximum I would recommend even for a very intense smokiness.

You might try to rig up a customized malt smoker. You could use screen material to form a cylinder about 15 inches long and 8 inches in diameter, closed at both ends with more screen or even sheet-metal disks. Then you could build a spit to turn it constantly over the smoke. Once you have smoked the malt as desired, use it immediately or freeze in a tightly sealed container until you brew with it.

Now that I've offered some advice, it's time to start brewing! The three recipes that appear on the next page provide an interesting array of smoked-beer styles.

A final note: In each of these recipes, all-grain brewers can replace each pound of dry malt with 1.5 lbs. of additional grain, increasing both mash and sparge water by

1.3 quarts per pound of grain added. All-extract brewers should steep the smoked grains and any additional specialty grains in 2 gal. at 150° F for 30 to 45 min., then add an additional .75 lb. of dry malt extract for each pound of grain malt omitted and proceed from boiling.

Brewers without access to smoked grains should use the same amount of grain malt in the recipes, but go for the smoke flavor by adding liquid smoke extract before you pitch the yeast. You can buy these liquid smokes at almost any supermarket.

Smoked Porter

(5 gallons, partial mash)

This is a robust, almost stout-like porter, similar to the beer that Greg Noonan brews at the Vermont Pub & Brewery in Burlington.

Ingredients:

- 2 lbs. pale malt
- 2 lbs. smoked malt
- 0.5 lb. black malt
- 0.5 lb. chocolate malt
- 3 lbs. unhopped dark dry malt extract
- 3/4 oz. Chinook hops (12% alpha acid, 9 AAUs)
- 3/4 oz. Goldings hops (4% alpha acid, 3 AAUs)
- English ale yeast slurry (Wyeast 1098)
- 2/3 cup corn sugar to prime

Step by Step:

A note on the malt: You can custom-smoke it over maple and apple, or you can buy a mix of half rauchmalt, half peated malt.

Heat 9 qt. water to 164° F. Crush grains, mix into liquor and hold 75 min. at 152° F. Runoff and sparge with 12 qt. at 168° F. Add the dry malt, mix well. Raise to boiling, add Chinook hops.

Boil 60 min., add Goldings hops, boil 5 min. Remove from heat, cool and add to fermenter with chilled pre-boiled water to make 5.25 gal. When cooled to 68° F, pitch yeast. Seal and ferment for three weeks at 65° F, rack to secondary and condi-

tion three weeks at 55° F. Prime with corn sugar and bottle.

Condition three weeks at 45° F.

OG = 1.055 (13.75° Plato)

TG = 1.016

Bitterness: 40 IBUs

Peat-smoked Wee Heavy

(5 gallons, partial mash)

This is a big, rich, malty and strong brew — the smoke, although present, seems restrained compared to all the other flavors.

Ingredients:

- 6 lbs. pale malt
- 2 lbs. peated malt
- 0.75 lb. medium crystal malt, 55° Lovibond
- 0.25 lb. roasted barley
- 2 lbs. unhopped amber dry malt extract
- 0.5 lb. dark brown sugar
- 1.25 oz. Northern Brewer hops (8% alpha acid, 10 AAUs)
- 1.5 oz. Fuggles hops (4% alpha acid, 6 AAUs)
- Scottish ale yeast slurry (Wyeast 1728)
- 3/4 cup brown sugar for priming

Step by Step:

Heat 12 qt. water to 164° F. Crush grains, mix into liquor and hold 90 min. at 152° F. Runoff and sparge with 15 qt. at 168° F. (Collect the first 3 qt. of runnings in a saucepan and boil until the runoff and sparge is complete, for an intense caramelized flavor.) Add dry malt, mix well. Raise to boiling, add Northern Brewer hops.

Boil 60 min., add Fuggles hops, boil an additional 30 min. Remove from heat, cool and add to fermenter along with enough chilled pre-boiled water to make 5.25 gal. When cooled to 68° F, pitch yeast. Seal and ferment for three weeks at 65° F. Then rack to secondary and condition another five to six weeks at 50° F. Prime with brown sugar and bottle. Condition for three weeks at 45° F.

OG = 1.075 (18.75° Plato)

TG = 1.020

Bitterness: 55 IBUs

Classic Rauchbier

(5 gallons, partial mash)

This is a Bamberg-style reddish lager, sweet and substantial like a Marzen, with the distinctive smokiness of a beechwood fire.

Ingredients:

- 3 lbs. lager malt
- 2.5 lbs. rauchmalt
- .5 lb. carapils malt
- .5 lb. Vienna malt
- 2.5 lb. unhopped light dry malt extract
- 1 oz. Hallertau hops (4% alpha acid, 4 AAUs)
- 1 oz. Tettnang hops (4% alpha acid, 4 AAUs)
- Munich lager yeast slurry (Wyeast 2308)
- 3/4 cup corn sugar or 1 cup light dry malt extract for priming

Step by Step:

Heat 10 qt. water to 164° F. Crush grains, mix into liquor and hold 90 min. at 152° F. Runoff and sparge with 14 qt. at 168° F. Add the dry malt to kettle, mix well. Raise to boiling, add Hallertau hops. Boil 60 min., add Tettnang hops, boil 30 min.

Remove from heat, cool and add to fermenter along with enough chilled pre-boiled water to make 5.25 gal. When cooled to 65° F, pitch yeast. Seal and ferment for two days at 55° F, then move to cooler place and ferment a further two weeks at 45° F, rack to secondary and condition six weeks at 38° F. Prime with corn sugar or dry malt extract and bottle. Condition six weeks at 35° F.

OG = 1.060 (15° Plato)

TG = 1.018

Bitterness: 28 IBUs ■

Scott Russell writes "Recipe Exchange" in every issue of Brew Your Own and also contributes feature articles to the magazine. He's the author, along with Greg Noonan and Mikel Redman, of Seven Barrel Brewery Brewers' Handbook (G.W. Kent, 1996).

HOMEBREWING DOWN UNDER

Three Aussie homebrew clubs share good tales and their best recipes

Homebrewing's alive and well Down Under. Like their beer-loving comrades in the United States, Australians have a fair amount of good commercial beer to choose from, and a few microbreweries are even popping up. But great store-bought beer hasn't deterred the Aussies from firing up their own brewkettles.

Without an association of homebrewers, it's hard to pin down exactly how many homebrewers there are in Australia. Not nearly as many as in the States, where more than one million people make their own beer at home. But that's no surprise, considering Australia's total population is just a fraction of America's. Still, the hobby is big enough to support a healthy trade of homebrew kits, sold in grocery stores and other outlets, plus two dozen specialty supply shops that cater to more serious homebrewers.

Australia has a few clubs, too. About a dozen "official" clubs, in fact, sanctioned by the American Homebrewers Association. There are probably scores more, hidden in villages and hamlets, cities and suburbs — but they won't appear on anyone's official roster.

We were curious about the state of homebrewing in Australia. Plus,

we wanted some new recipes. So we did a little research and found three Aussie homebrew clubs with some interesting tales to tell.

Mashing in Melbourne

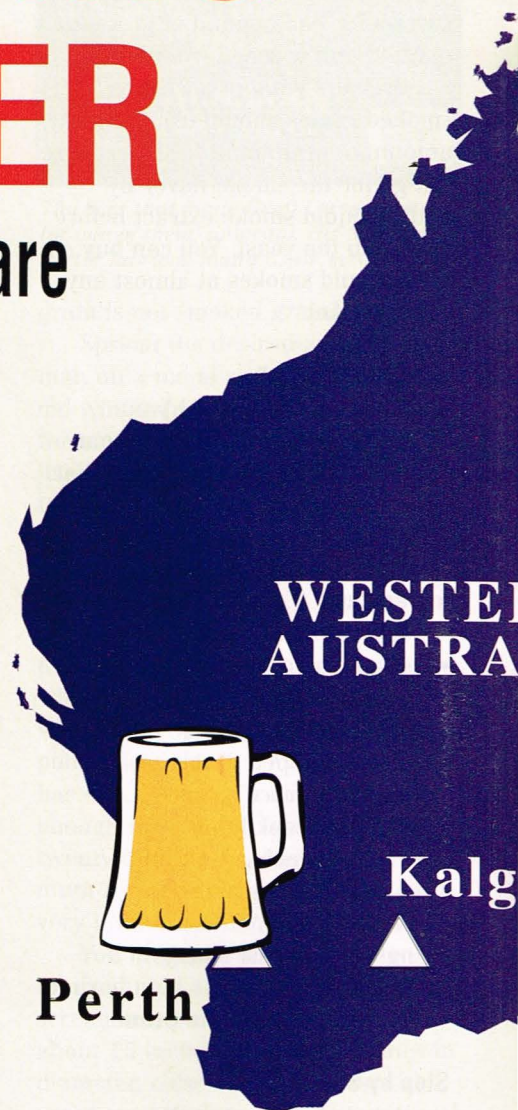
Wort Hogs: The Feral Fermenters



"Wort Hogs: The Feral Fermenters" is headquartered in Melbourne, the state of Victoria's large port city. The club, five years old, has about 40 members, quite large by Australian standards. It is structured like a typical U.S. club, with regular meetings, newsletter, competitions and special events.

Paul Bowlen is the Wort Hogs' publicity man, newsletter editor and all-around go-to guy. He owns a homebrew shop in Greensborough, a Melbourne suburb. Bowlen says Wort Hogs' members are into everything, from basic ales to advanced lagers and pilsners, Oktoberfests and Belgian beers. "It's a laid-back bunch," he says. "We like to have a good time. But we also pay attention to detail and we're making some top-notch beer."

He should know. Bowlen is the current Victoria state champion. At the most recent competition he won two first-place ribbons, for "Belgian





by Sal Emma

Specialty" and "Fruit and Herb" beers, plus a second-place ribbon for his cider. "That was a bit of a surprise. I was up against some bloody great brewers," he says. "I had been doing the radio and newspaper publicity for the competition, so it made sense for me to emcee it. There I was, announcing my own win. I felt like a right idiot."

Bowlen says the club has a good mix of brewers. "About 30 percent are deadly serious all-grainers, the nutty professors. Fifty percent are extract brewers, but serious enough to want to improve their skills. Another 20-odd percent are kit brewers. They make it to drink it, and don't get fussed about the particulars," he says.

The club sponsors the usual brewery tours, barbecues, restaurant outings and such. Occasionally they join up with another club for a brewing day at a local micro, where they make 260 gallons, then split the wort up amongst members.

Their summer party is the biggest event of the year. "The Christmas breakup is always entertaining. We hold it at one of the lad's bush block — basically a shed and an open fire in the middle of 110 acres of woods," he says. (Christmas is mid-summer in the southern hemisphere. A "breakup" is a party.) "It's our cultural highlight," Bowlen laughs.

Here's the recipe for Bowlen's raspberry lambic. The beer was judged at nine months and took first place in the "Belgian Specialty" category at the state championships.

Cinderella's Curse Raspberry Lambic (10 gallons, all-grain)

Ingredients:

- 13.25 lb. pale two-row malt
- 2.25 lb. malted wheat
- 4.5 lb. raw wheat
- 1 oz. Pride of Ringwood hop flowers (10% alpha acid, 10 AAUs)
- Wyeast 1056 (American Ale)
- Wyeast 3278 (Belgian Lambic)
- 17.5 lbs. frozen raspberries

Step by Step:

This is a standard single-step infusion mash. Mash-in grains with 30 quarts of 165° F water. Mash at 153° F for two hours. Mash out for 15 min. at 167° F. Recirculate wort until clear, sparge with 170° F water and collect 11.5 gallons of wort. Bring to a boil, add hop flowers and boil for 60 minutes. Cool to 70° F, aerate and pitch the Wyeast 1056 (American Ale yeast).

Ferment at 65° to 70° F for two weeks. Rack onto frozen raspberries and add Wyeast 3278 (Belgian Lambic). Secondary fermentation is at 70° F for at least three months. Rack into keg and carbonate.

OG = 1.060

FG = 1.012

Bitterness = 20 IBUs

Perfect Pints in Perth West Coast Homebrewers



Kim Hartley presides over West Coast Homebrewers, a seven-year-old club with 30 members in Australia's main western port. Perth is a full continent away from Sydney and the industrialized southeast, where grains, hops and yeast are plentiful. "Cooper's Sparkling Ale yeast is the homebrewer's best friend here," says Hartley, a fireman. "A lot of us restart the yeast at the bottom of the bottle, compliments of Mr. Cooper. It travels better than the homebrew yeasts, which are not as vigorous and more sensitive to hot weather."

Although his hobby saves him money, Hartley brews for flavor. "Commercial beer can't come close to a homemade full-mash beer in mouthfeel or flavor," he says. "We use the best ingredients and a lot of them, since we're not trying to meet a price, like the commercial brewer. Regular beer costs about \$1 a can here. Boutique beers will cost up to \$3. Homemade averages 20 cents."

Hartley says a lot of Australians use extract kits, cooked in an electric immersion-coil plastic bucket, but most of the club's members are expert full-mash brewers. They're

into styles like pilsners, Belgians, Oktoberfests and barleywines.

Hartley learned to brew from his father, Bill, who's been brewing since the 1960s. Father and son have built big systems, scrounging for parts in junk yards. They both brew in large copper boilers — two halves of a hot water tank they cleaned, cut and modified. Kim's mash tun is a stainless tank that Kodak once used to develop X-rays.

He's developed a uniquely Australian way to heat his system. "I used to use gas rings, but it took too long and used a lot of expensive gas. Now I use Jarrah wood to fire the kettle. It burns hot and clean and brings 30 gallons to a boil in no time," he explains.

The club meets each month in an old kindergarten. They also run a members' competition and brew sessions in member's homes. One member keeps a yeast bank, offering slants for sale cheaply to other members. And the club has used its purchasing power to negotiate with area maltsters who won't sell to individual homebrewers.

Lack of supplies has not stopped the West Coast Brewers from making good beer. They improvise. "Most of our members roast their own specialty malts. And a few are malting their own, too," he says.

Here's a recipe from John Manwaring of the West Coast Homebrewers. It took first place in a recent club competition.

John's Steam Beer (5 gallons, all-grain)

Ingredients:

- 10 lb. pale malt
- 5 oz. crystal malt, 64° Lovibond
- 9 oz. chocolate malt
- 12 oz. dark wheat malt
- 9 oz. "puffed wheat" cereal
- 1.75 oz. Styrian pellets (5.2 % alpha acid, 9.1 AAUs)
- 1.5 oz. Sticklebract pellets (11% alpha acid, 16.5 AAUs)
- 1 oz. Fuggles
- 3/4 cup invert sugar
- 1 tbs. gypsum

- 1 tbsp. Irish moss
- California lager yeast

Step-by-Step:

Mash in grains and gypsum with 18 qts. of 161° F water. Mash at 149° F for 60 minutes. Recirculate wort until clear, sparge with 170° F water and collect 5.75 gallons of wort. Bring wort to a boil. After 30 minutes of boiling, add half of Styrian hops and half of Sticklebract hops. Boil for an additional 40 minutes. Add the remaining Styrian and Sticklebract hops. Boil for 20 minutes longer. Total boil is 90 minutes.

Cool wort to 65° F, aerate well and pitch yeast. Ferment at 65° F for about a week or until fermentation finishes. Rack to secondary and add gelatin finings (dissolved in 1/2 cup warm water) and 1 oz. of Fuggles to dry hop. After 2 weeks in secondary, rack to bottling bucket, add priming sugar and bottle. Condition for at least 2 weeks.

OG = 1.064

FG = 1.014

Bitterness = 65 IBUs

Hot Enough for You? Craftbrewers of Queensland



"We've basically got three seasons here," explains Graham Sanders of the Craftbrewers of North Queensland. "Hot. Very hot. And bloody sticky and hot. From March to September, it's warm and dry. From September to January, the monsoon is building. You sweat like a pig all day long. In February the monsoon kicks in and it rains buckets day after day," he says.

Sanders holds court with his dozen club pals in Townsville, a few hours south of Cairns and some 1,350 miles north of Sydney. He works for the Queensland government, in construction licensing.

"The club's seven years old. We've left behind the basic brewers. We're a group that wants to get better and more advanced," he says. "Still, we're just guys who like to get together with good beer."

"As brewers we've got two tyrannies to deal with: heat and isolation. We're far from the rust belt, down south where the industry is, so it's hard to get equipment and supplies. We're an innovative lot. We've been designing and building our own gear since the beginning.

"When we started there was precious little in the way of gear, books and know-how. There was no Internet. But we have a very broad base of skills and educational backgrounds, so we managed all right. I laugh when I see brewers on the Internet, just now getting their knickers in a knot over RIMS systems. Bloody hell, we've been building RIMS systems for five years. No worries!" he laughs.

"The heat we deal with in a variety of ways. Most of us have extra fridges and freezers. Of course, the air conditioning runs all the time," he says.

Club members make a variety of styles, from German lager to English ale, Belgian specialties and everything in between. "We have a few members who brew American styles. Your oatmeal stouts, steam beer and California ale. I'm really impressed with that American Ale yeast. It's a ripper! Great for when you want to mimic a lager at ale temperature," he says.

Sanders keeps a yeast bank going for club members. And they get together regularly to compare domestic and imported commercial beers "to see how our beers scrub up," he explains.

Sanders and his mates take advantage of their tropical home, using interesting ingredients in their beers. "I perfected a gorgeous mango lambic, I did," he says. Sanders picks his own mangos, lychees, starfruit and grapes. "You have to be careful with mangos. My first mango lambic tasted great going down, but after three or four glasses, you'd run like mad to the bathroom. It's something called 'the mango effect,'" he says.

Should you ever find yourself brewing with mangos, keep that in

mind. In the meantime, here's Sanders' Kölsch recipe.

Graham's Kölsch (10 gallons, all-grain)

Ingredients:

- 15.5 lb. Pilsner malt
- 0.5 lb. Caramunich
- 1 lb. plus 1.5 oz. raw wheat
- 1.4 oz. Pride of Ringwood (10% alpha acid, 14 AAUs)
- 0.33 oz. Hersbrucker (4% alpha acid, 1.3 AAUs)
- 0.33 oz. Hersbrucker (4% alpha acid, 1.3 AAUs)
- Wyeast 2308 (Munich Lager)
- Wyeast 2565 (Kölsch)
- 3/4 cup priming sugar

Step-by-Step:

Mash into the water at around 140° F. The target for this rest is 122° F. Then remove 40 percent of the grain to a large pot and heat to 158° F. Hold for 20 min, then bring to boil for 5 min. Add to mash tun and stir well. Toss in a few handfuls of rice husks to loosen the mash.

The target temperature is 149° F. Hold one hour, while heating sparge water to 167° to 170° F. Sparge, collecting 12 gal. wort.

After chilling, siphon off 1 gal. wort into a sanitized container. Seed with Munich lager yeast. Ferment at 50° F. Place the remaining wort in a separate fermenter, and pitch Kölsch yeast. Ferment at 60° F.

After four days, drop the ale to 50° F and pitch the lager portion into the ale portion. At 50° F, the ale yeast shuts down and the lager yeast takes over, fermenting some of the sugars that the ale yeast can't handle. Let the lager yeast work eight days, then drop the temperature to 32° F and hold until clear. Add priming sugar, bottle and condition for at least two weeks.

OG = 1.050

FG = 1.010

Bitterness = 35 IBUs ■

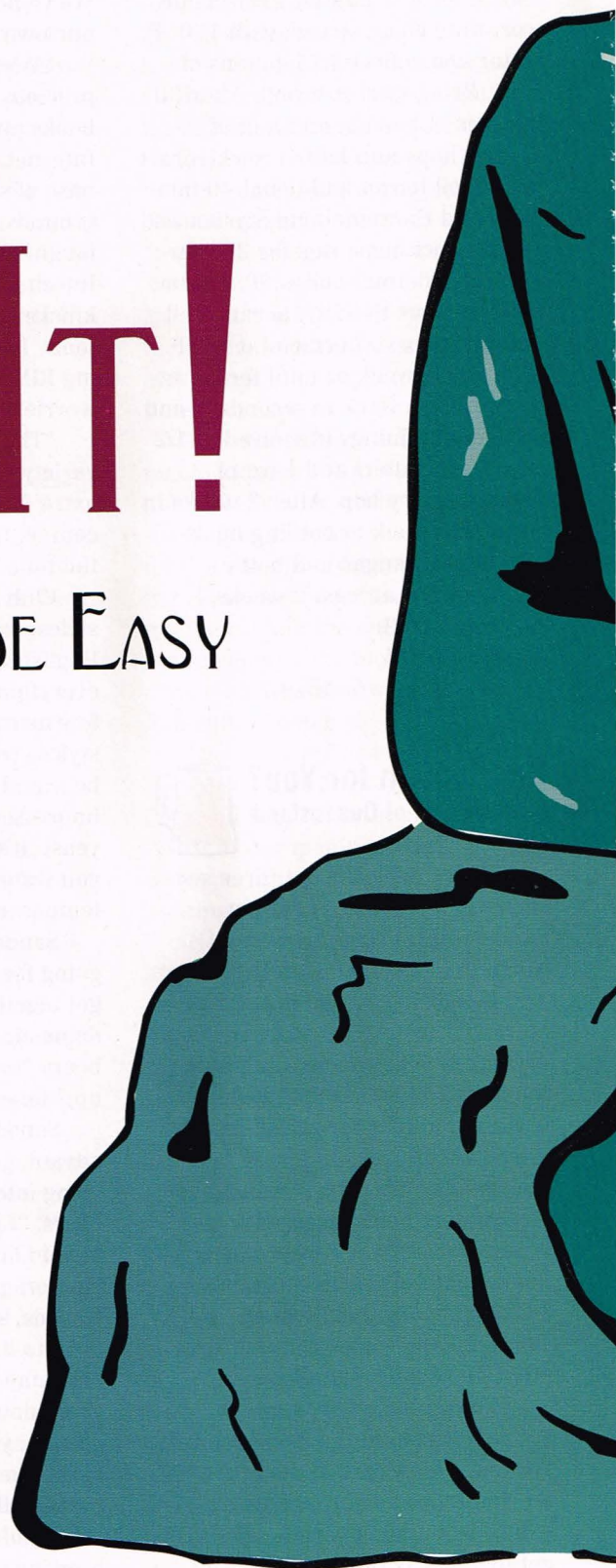
Sal Emma wrote "Three Great American Brewers" in the March issue of Brew Your Own.

JUST... BREW IT!

THREE HARD BEERS MADE EASY

*STEP-BY-STEP TIPS
FOR BREWING A TRIO OF
UNDERRATED BEERS:
SCOTCH SPRUCE ALE,
FLEMISH SOUR AND A
BLENDED BLACK AND TAN*

By Mikoli Weaver





SPRUCE? FLEMISH SOUR? BLACK AND TAN?

Some of the best things in life take work and dedication. These three beers take just that — work, dedication and devotion to brewing as an art and skill. After all, beer is drinkable art.

SPRUCE ALE

Spruce ales were introduced to Scotland by the wayfaring Vikings. Many explorers, including Captain Cook, took spruce beer with them to sea, since it helped prevent scurvy. The style made its way to America through brewers in the founding colonies. An alternative to hopped beers, spruce beers were produced regularly until the end of the 19th century.

Alba Scots Pine Ale (Alba is Gaelic for “Scotland”) is a Scotch ale of 7.5 percent alcohol content made with white-pine and black-spruce boughs. Brewed by Heather Ale Limited in Lanarkshire, Scotland, the Alba won a World Gold Medal in 1998.

The Scots Pine is subtly flavored with spruce; in fact, it doesn't show up until the finish. The nose is fragrant with yeast, malt and slight amounts of alcohol. It opens up through the middle into a floral, caramel-laden brew with rich malt and warming fruit flavors. Then the spruce follows, light in the back of the throat. This is a well-balanced, dignified beer.

Our homemade version will be a straightforward Scotch ale with pale, crystal and chocolate malt. The spruce flavor will come from the real thing.

When the trees start to bud in spring, find a good, healthy spruce or pine that's free of pesticides. The buds are the new growth you'll see on the branches. They have little needles on the end; they are green, tender and very aromatic. Try not to pick any branch

with the buds, because the wood will impart pine-sap flavors.

You'll add the buds to the brew kettle toward the end of the boil for flavoring and to sterilize them. This is the best way to prevent contamination from wild yeast. If the finished beer has a burnt and medicinal flavor (imagine hickory-smoked Listerine), the wild yeast won. Toss it and start over.

Scotch Spruce Ale

(5 gallons, all-grain)

Ingredients:

- 8.75 lbs. marris otter
- 1 lb. carapils or dextrin-type malt
- 1 lb. crystal, 40° Lovibond
- 0.25 lb. chocolate malt
- 1 oz. Fuggle (4.2% alpha acid, 4.2 AAUs)
- 0.50 oz. Fuggle (4.2% alpha acid, 2.1 AAU)
- 2 cups of loose, fresh spruce buds
- 1 oz. Kent Goldings (5.5% alpha acid, 5.5 AAU)
- 1 pt. starter of Wyeast 1728 (Scottish Ale)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 3.5 gal. of water at 150° F for 60 min. Sparge with 168° to 170° F water to collect 5.75 gal. of wort. Total boil is 90 min.

At beginning of boil add 1 oz. Fuggles and boil 60 min. Add 0.50 oz. Fuggles, boil remaining 30 min. Add spruce buds during last 2 min. of the boil. At end of boil, add Goldings to finish. Whirlpool and cool to 69° F to pitch starter. Oxygenate-aerate well.

Ferment at 69° F for seven days, then rack to the secondary fermenter. Continue fermentation for seven more days until gravity is about 1.008 (2° Plato) or fermentation is finished. Rack the beer into a sanitized vessel, then prime and bottle. Age the beer for seven days before drinking.

OG = 1.048 (16.5° Plato)
Bitterness = 23 IBUs
Color = 18° SRM
7.4% ABV

Extract with Grain Option:

Substitute 8 lbs. English pale malt extract for the Marris otter. Steep crushed grain in 5 gal. 150° F water for 30 min. Sparge grains with enough 170° F water to make 5.5 gal. Heat to boiling and add extract. Total boil will be 60 min. At beginning of boil add 1.25 oz. Fuggle hops (5.25 AAU) and boil 30 min. Add 0.50 Fuggles, boil 30 min. Add spruce during last 2 min. of boil. At end of boil, add Goldings to finish. Whirlpool and cool to 69° to pitch starter. Follow fermentation schedule for all-grain version.

FLEMISH SOUR

This informally recognized style is reminiscent of the beloved lambics that also are produced in Belgium. They have a puckering sourness caused by bacteria present in the fermentation process and a slight undertone of wild yeast. They are refreshingly crisp and, without a doubt, artisan ales.

Rodenbach Red is the best and most famous example of this rare style. It is produced at the 164-year-old Brewery Rodenbach in Flanders, where a French ambience fills the countryside and rustic farmhouse beers like saison and brown have long been produced.

Rodenbach brews three beers: Red, Grand Cru and Alexander. The Red is a blended beer of young and old sour, not unlike a "gueuze" lambic, at 4.6 percent ABV. The Grand Cru is an unblended product at 4.1 percent ABV. Alexander is the Grand Cru flavored with cherry juice. It comes in at 5.2 percent alcohol by volume.

We're making the unblended Grand Cru. But first, a note on the Rodenbach Red. Brewed with Vienna malt and five yeast strains, the beer is aged 18 months in oak casks. This aged ale is then mixed with young beer (six weeks old) to create its signature ruby color and tart, fruity flavor.

This older beer is the Grand

Cru. Like a lambic, it undergoes not only the regular fermentation, but a lactic-acid fermentation as well. This is caused by natural lactobacillus in the beer and acetobacter present in the wooden casks. Lactobacillus creates lactic acid to add acidity, and acetobacter (particularly heinous in normal beer) turns ethyl alcohol to acetic acid.

Since many homebrewers do not have access to wine casks for aging, one option is to use barrel staves. Most wineries sell old staves that you can split up into small pieces to fit into a fermentation vessel. Or you can use a few handfuls of oak chips, available in most homebrew shops. It's up to you to decide how long to leave the oak in the fermenter, but remember: Rodenbach is aged for 18 months in oak. Another idea is to add a lactic culture, available from a homebrew store. I'd recommend Aeonbrau 333 (Lactobacillus Flandrii).

Now comes the hard part. The Rodenbach yeast strain is not really one strain. It is a combination of five different strains. Because of the flavor, we know it has at least some brettanomyces (wild yeast). The strains in this recipe are a guess, but based on experience and the flavor of the Rodenbach Grand Cru, it will all come out pretty close.

The Grand Cru is pasteurized so that the sugar added before bottling will not ferment. If your homemade Grand Cru isn't pasteurized, it's not really suited for cellaring, which is ironic since it takes so much time and work to create.

This brings up the issue of pasteurizing at home to emulate the Rodenbach product. The brewery "flash pasteurizes," which is done very quickly before bottling. At home, the ideal would be to add a primer and bottle, but this is not going to work, since the priming yeast would eat all of the sweetening sugar and overcarbonate the beer. Picture bottles exploding all over the basement.

A warning: Do not sweeten the beer, allow it carbonate, and then

pasteurize it. It sounds like the perfect way around the problem, but it's also a good way to blow up your bottles in the pasteurizing kettle.

Instead, here's what I'd recommend. First, chill the beer. Sweeten it, force-carbonate in a keg and bottle it right away using the counter-pressure fill method. Then pasteurize the bottles in a water bath at 155° F for ten minutes.

Flemish Sour Grand Cru

(5 gallons, all-grain)

Ingredients:

- 4 lbs. British pale malt
- 3 lbs. Vienna
- 1 lb. caramunich 80
- 0.75 oz. Brewers gold (6.0% alpha acid, 4.5 AAU) for 90 minutes
- 0.5 oz. Kent Goldings (5.4% alpha acid, 2.7 AAU) for 30 minutes
- 2 pts. mixed starter of Wyeast 3278B (Lambic blend), 3944 (Witbier blend), 1214 (Belgian ale)

Step by Step:

Mash grain in 2.5 gal. of water at 150° F for 60 minutes. Sparge with 168° to 170° F water to collect 5.75 gallons of wort. Total boil time is 90 minutes.

At beginning of boil add Brewers gold and boil 60 minutes more. Add Kent goldings, boil remaining 30 minutes. Whirlpool and cool to 68° F to pitch starter. Aerate and oxygenate well.

Ferment for 14 days, then rack to secondary fermenter and add oak staves or a few handfuls of oak chips (if you are not fermenting in oak vessels). Continue fermentation and aging for at least 12 months. Try to keep beer at cellar temperature (55° F).

At end of 12 months evaluate the flavor of the sour. Lactic cultures can be added to the beer to create sourness if it does not seem to be progressing well enough.

Sweeten if desired. The best thing to use would be Belgian candi sugar, heated the way you'd prepare a corn-sugar solution for priming. Force-carbonate, then bottle as

discussed above. Pasteurize the bottles at 155 degrees for ten minutes.

OG = 1.052 (13° Plato)

Bitterness = 22 IBUs

Color = 20° SRM

4.3% ABV

Extract with Grain Option:

Substitute 6 lb. pale malt extract (with some Vienna if possible) for the British pale malt.

Steep grain in 5 gals. of 150° F water for 30 min. Sparge with 168° to 170° F water to collect 5.5 gals. of wort. Total boil is 60 min. At beginning of boil, add 1 oz. extract and Brewers gold and boil 30 min. more. Add Kent Goldings, boil 30 min. Whirlpool and cool to 68° F to pitch starter. Aerate-oxygenate well. Follow fermentation schedule for all-grain version.

BLACK AND TAN

The term black and tan can be a bit of an enigma. Depending upon the source consulted, it can mean several things. It is basically Guinness on top of some other beer. To many this other beer is a bitter like Bass. Others use Abbot ale.

To most it is synonymous with the term "half-and-half." But that can mean a couple of things, too. Many consider the classic half-and-half to be Bass ale with Guinness floated on top, while the "all-Guinness" version is Harp with Guinness on top.

Whatever it is supposed to mean in a classical sense, it has evolved into a separate brewing technique in recent years. By this definition, a black and tan is a smooth brown beer with a dry, malty accent. Some hop character can be perceived in the finish, although this is slight, with an emphasis on crisp cleanliness and low alcohol.

All black and tans begin as two different beers and are blended later. The black and tan made by the Gray Brewing Company in Janesville, Wisconsin, is blended in the fermenter. But the version made

by Genesee Brewing in Rochester, New York (called Michael Shea's Black and Tan) is blended after fermentation. Blending in the fermenter is easier, while blending afterwards is safer if one batch gets contaminated.

This recipe will use a typical dry stout and a light lager. Our beers will be blended after fermentation is complete to give better control over each product.

You need to time your brewing schedule so the beers are ready for bottling at the same time. The lager ferments 14 days, then settles for another week at 40° F. So make that beer first. A week later, brew the stout, which ferments 14 days. When both beers are ready to bottle, combine the five-gallon batches in a sanitized container. Prime this ten-gallon batch and bottle it. Allow your blended black and tan to age at least a week in the bottle; check the carbonation at that point and decide whether it's ready to drink.

Light Lager for Black and Tan

(5 gallons, all-grain)

Ingredients:

- 7 lbs. pale pilsner malt
- 1 lb. carapils
- 0.5 lb. crystal, 10° Lovibond
- 0.75 oz. Tettnang (4.5% alpha acid, 3.4 AAU) for 60 minutes
- 0.75 oz. Hallertau (3.5% alpha acid, 2.6 AAU) for 30 minutes
- 0.75 oz. Hallertau (3.5% alpha acid, 2.6 AAU) for 15 minutes
- 1 pt. Starter of Wyeast 2178 (Lager Blend)
- 2/3 cup corn sugar for priming

Step by Step:

Mash grain in 3 gal. of water at 150° F for 60 min. Sparge with 168° F water to collect 5.75 gallons of wort. Total boil is 90 minutes.

After 30 minutes add Tettnang hops and boil 30 more minutes. Add the first Hallertau, boil 15 more minutes and add last Hallertau. Finish boiling remaining 15 minutes. Whirlpool and cool to 45° F to pitch starter. Oxygenate-aerate well.

Ferment at 45° F for three days. Raise to 55° F over four more days, then rack to secondary. Continue fermentation for seven more days until gravity is 1.012 (3° Plato). Cool to 40° F or below and let settle for seven more days. Blend with stout, prime and bottle. Condition beer for at least seven days before drinking.

OG = 1.048 (12° Plato)

Extract with Grain Option:

Substitute 6.5 lbs. pale pilsner malt extract. Then follow the all-grain recipe.

Dry Stout for Black and Tan

(5 gallons, all-grain)

Ingredients:

- 5 lbs. marris otter
- 2 lbs. two-row pale malt
- 0.5 lb. carapils
- 0.5 lb flaked barley
- 1 lb. crystal, 120° Lovibond

- 0.5 lb. roasted barley
- 1 oz. Fuggles (4.2% alpha acid, 4.2 AAU) for 90 minutes
- 0.5 oz. Fuggles (4.2% alpha acid, 2.1 AAU) for 45 minutes
- 1 oz. Kent Goldings (5.4% alpha acid, 5.4 AAU) at end of boil
- 1 pt. starter of Wyeast 1084 (Irish Ale)
- 2/3 cup priming sugar

Step by Step:

Mash grain in 3 gals. of water at 150° F for 60 min. Sparge with 168° to 170° F water to collect 5.75 gals. of wort. Total boil time is 90 min.

At beginning of boil, add 1 oz. Fuggles and boil 45 min. Add 0.5 oz. Fuggles, boil remaining 45 min. At end of boil, add Goldings. Whirlpool and cool to 69° F to pitch starter. Oxygenate-aerate well.

Ferment for seven days, then rack to secondary. Continue for seven more days, or until fermenta-

tion is done and gravity is about 1.008 (2° Plato). Blend with lager, prime and bottle. Condition in bottle for at least seven days.

OG = 1.052 (13° Plato)

Extract with grain option:

Substitute 6.5 lbs. pale malt syrup for the marris otter and two-row pale malt. Steep grain in 5 gals. of 150° F water for 30 min. Sparge grains with enough 170° F water to make 5.5 gal. Heat to boiling and add extract. Total boil is 60 min. At beginning of boil add 1.25 oz. Fuggles, continue 15 min. and add 0.5 oz. Fuggles. Boil for 45 min. Add Goldings and whirlpool. Cool to 69° F and pitch starter. Oxygenate-aerate well. Follow fermentation schedule for all-grain version. ■

Mikoli Weaver writes "Style of the Month" in every issue of Brew Your Own. He lives in Portland, Oregon.



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CIRCLE 22 ON READER SERVICE CARD

Homemade Hopbacks

Three simple ways to add a big hop blast

by Craig Hartinger



Ah, hops. One of the brewer's most remarkable feats is melding the compelling flavor and aroma of hops into beer — subtle or bold, elegant or pure pinecone, earthily British or organically German.

The magic hop essence results from contact between wort and hops, and the variables stretch out to infinity. Just for starters, brewers must consider the quality of the hops (their variety, harvest and cure, how they are processed and stored) and the mechanical details of the boil (things like gravity, temperature and motion). There are also dangers to avoid: oxidation, hops that clog liquid flow, and wort-volume loss. On top of all that, we can't forget that hops are an agricultural product supremely susceptible to climate, weather, pests, drought and good old *gout de terroir* — the “flavor of the earth.”

A hopback (otherwise known as a hop-back, hop back or hop jack) is a device that strains spent, boiled hops out of wort. That's where the

name comes from, in fact: It's something that's supposed to hold the hops back. At the same time, a hopback also helps filter undesirable coagulated protein (“hot break”) from the boil. Most brewers would argue that a hopback is more than just a filter device: The term also has come to imply that the gizmo uses an addition of fresh, unboiled hops as a filter medium and as a way of imparting additional hop character to the wort. Technical brewing sources, by the way, use the term “hopback” for a device that is outside and separate from the brewkettle.

A commercial hopback is usually designed like a mash tun and has an inlet, where the wort (still containing kettle hops and coagulated proteins) enters. It features some kind of screen or false bottom, where the fresh hops are added, and an outlet. Technically, the three easy devices I describe below — the Choreboy, the Mason jar and the funnel — may not actually be “hopbacks.” But they're cheap, they're simple to make and use, and, as far as homebrewing is concerned, they definitely do the job.

Why Would I Want a Hopback?

The intense hop flavor that can come from use of a hopback makes more sense when you start thinking about the surface area of hops exposed to beer. In the hopback, a relatively small volume of wort is forced past hops at temperatures that meld the elusive hop aroma with the wort — the aromatics don't boil away into the atmosphere,

because the hopback usually is closed off from air exchange. Then the wort passes into a counterflow chiller, where the quick temperature drop helps stabilize the volatile character and nuances of the bouquet. Some brewers will tell you that for elegant, forward hop character, a hopback is a must.

The flavor in the finished beer? Carbon dioxide “scrubbing” action during fermentation tempers the big *humulus lupulus* — that's Latin for hops — exposure from the hopback. The CO₂ bubbles carry away hop aroma as they escape. (That's why you keep smelling your airlock. Mmmm.) Scrubbing is always a concern for any hops used before fermentation, and hopbackers take this effect into account while refining recipes. Beer brewed with a hopback often teases tasters into a debate—“dry-hopped, hopback or just loads of super-late hops?”—as legions of brewers did when creating their own version of Sierra Nevada Pale Ale. But for an elegance of flavor, and for some hop varietal carryover into the beer, the hopback can be just right.

(Of course, if you want pure, right-from-the garden hop character, distinct from the malt and very green, wait until fermentation has stopped completely. Then dry hop, relaxed by the knowledge that the alcohol in the beer will help reduce chances of contamination. Though your beer has a fresh-hop blast, you might not notice the same melding of flavors, the depth and nuances supporting the hop punch, that will result from using your hopback.)

One obvious pitfall to running

any liquid through any filter is clogs. Pellet hops turn into an absolutely liquid-proof goo that will clog many hop filtration systems, from a kitchen strainer to a hopback. (Brewers who use pellet hops often separate the sediment from the wort by means of a whirlpool, and some homebrewers whirlpool in their kettle by stirring with a big nylon spoon. The green goo will clump together in the middle of the vessel as the spinning wort slows down, and clearer wort can be drawn off the edge.)

Even leaf hops can't be shoved into a bottleneck with total impunity. When using a hopback or hop strainer of any kind, begin the liquid flow smoothly and keep it slow. Don't attempt to build or use any kind of hopback that has a really tiny surface area, whether it's a Mason jar or a Choreboy scrubber. Remember: More space, slower flow and fewer clogs.

There's another general caution to using any kind of hop filtration. Hops, with their vast surface area, force the brewer to guard against technique failures that can lead to stale flavors in the finished beer. Handle your wort with a minimum of exposure to air when it is between 80° F and 180° F. At that temperature range, a chemical reaction can occur between atmospheric oxygen and your wort: oxidation, a cause of bad sherry-like flavors in finished beer. Starting the wort flow very slowly — no gurgles or bubbles! — through added fresh hops in the jack will help, as will knocking out through a kettle spigot and hose, rather than a funnel. ("Knockout" is a brewers' term for running wort out of the brewkettle.) Remember that even in a hopback open to oxygen, the liquid is usually hot enough to be out of the contamination danger zone.

Some brewers contemplate plac-

ing the hopback after the wort chiller, but hopbacks really work best with hot wort. The sanitation of the hops and of the device are not an issue because of the heat, and the hot liquid helps volatilize the elusive hop aroma. A brewer running cooled wort through a hopback would definitely filter more coagulated protein (the "cold break" precipitated in the chiller) out of the wort, but might also run an infection risk (because the cooled wort won't kill any microbes on the hops) and would have to expect less hop effect (because the hops wouldn't be volatilized by heat).

So a hopback filters "spent" hops and hot break (coagulated proteins) out after the boil, all without clogging the brewkettle outflow. It can also be a way to add super-late hops to the recipe, with no flavor components driven off by a boil. In fact, this addition of fresh hops at knockout is the option that makes

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some brewers swear by hopbacks.

So how do you make one? Here are three easy and inexpensive devices to enhance your homebrew equipment. All the hopbacks I mention can be placed in line just before a wort chiller.

The Choreboy Hopback

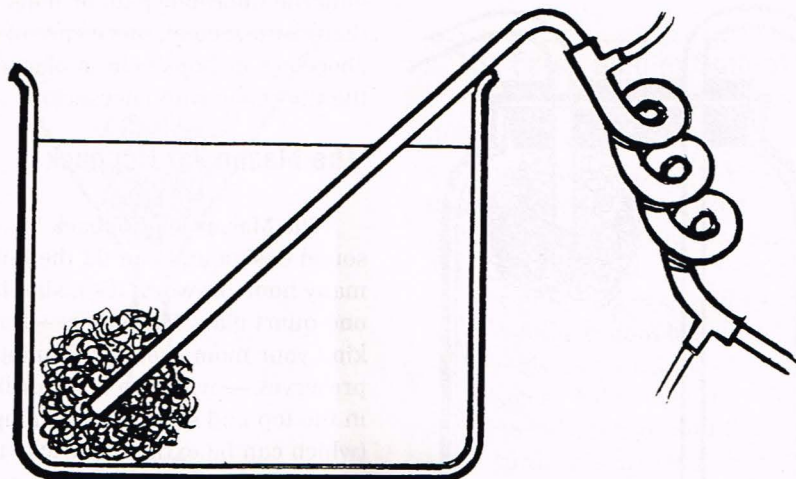
The simplest version of a home hopback is the famous stainless steel or copper "Choreboy" surrounding the end of your steel or copper racking cane (see illustration at right). Use the coarsest steel wool that you can find at the super-market — grades 3 or 4, like the super-tough scrubbies used by restaurant pearl divers (that's dishwashers, if you're lucky enough to be unfamiliar with this term).

Pull the Choreboy into a spherical shape with the end of the racking cane right in the middle. That way, the liquid moves slowly

towards the opening and doesn't clog the passage. Some brewers wire the scrubby to the cane, but it will stay in place by itself fairly well because the weight of the cane holds it to the bottom of the kettle.

After rising up the cane through siphon action, the wort enters your counterflow chiller and from there goes to your fermenter.

Experiment with different setups: a handful of fresh hops layered



Choreboy hopback: Buy a stainless-steel scrubber and attach it to your racking cane. Surround it with fresh hops held in place by cheesecloth or a second Choreboy. This diagram shows the racking cane attached to a counterflow wort chiller.



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Mason Jar: The "wort-in" nipple has copper tubing that extends to the bottom of the jar. The "wort-out" nipple has a short tube protected by a Choreboy.

onto the Choreboy pad; or hops held there by a second, more spread-out choreboy; or hops held in place on the Choreboy with cheesecloth.

The Mason Jar Hopback

The Mason Jar hopback has sound design and can fill the bill for many homebrewers. It's a simple one-quart glass Mason jar — the kind your mom used for canning preserves — with two holes drilled in the top and sealed to two nipples (which can be extremely tricky to seal). Better yet, it can be the same jar with a huge rubber two-hole stopper and two different lengths of copper pushed through the holes. This is easier, even if you have to drill the second hole. The stopper size will be around #13 — bring your jar to the local hardware store to check the fit.

Under the stopper or lid, the

"wort-in" nipple has copper tubing that extends to the bottom of the jar. The "wort-out" nipple has a short copper tube protected by a copper or stainless-steel Choreboy (see illustration at left).

The fresh-leaf hops get packed into the Mason jar; the top goes on and the flow of liquid begins. Be careful to pretemper the glass jar (with hot water) and to begin the flow slowly to avoid aerating the hot wort! As the wort rises through the fresh hops they will migrate toward the Choreboy and form a great filter bed, while also giving up great hoppy flavor.

This inline hopback, with its sealed system before the wort chiller, is probably ideal. If a Mason jar is a little too homemade-looking for you, you can buy or make the same thing out of stainless. Either way, it can contribute to a most incredible fresh hop flavor.

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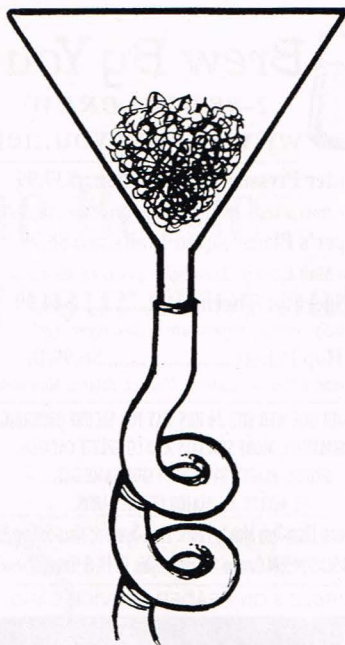
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CIRCLE 33 ON READER SERVICE CARD

The Funnel Hopback

Because the hopback is best placed in line with a wort chiller, some brewers use an open funnel that they can just pour the wort right into. A Choreboy filled with fresh hops sits down in the funnel, the hose to the counterflow chiller is attached to the tip of the funnel, and you gently pour wort in the top, watching the liquid level be sure that your pour is matching the out-flow (see illustration at right). This way you don't have to start a siphon through the chiller.

Whether you choose the simple Choreboy on a racking cane, the Mason jar or the funnel device, one thing is definitely guaranteed: Your brewing setup now has one more tricky, unique and controversial gadget that you can mix into brewing debates with your buddies for years to come! ■



Funnel hopback: A stainless-steel Choreboy filled with fresh hops is placed in a funnel. The funnel is directly attached to a counterflow wort chiller.

The False Bottom Option

A false bottom or copper manifold in your mash kettle — maybe the same one you use to lauter with — is also a good hopback, although you may have to plunge a hop-steeping sack in at the right moment to add fresh hops. A false bottom has a big surface area so it is unlikely to get clogged. A box of perforated stainless sheeting around the kettle drain will also hold back spent hops, but it doesn't offer any easy ways to add fresh hops.

Craig Hartinger is the former manager of the Liberty Malt Supply Company, a homebrew shop in Seattle. A frequent BYO contributor, his most recent article was "Your First Brew" (January 2000).

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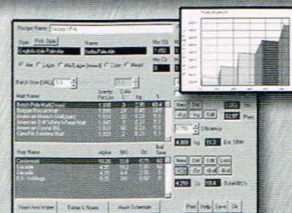
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Life Beyond the Bottle

A guide to kegging your first batch of beer

by Gretchen Schmidhausler



First draft: This is a standard set-up. It has a Cornelius keg to hold the beer, a carbon-dioxide tank, a two-gauge regulator and a "cobra head" tap.

To keg or not to keg? For many home brewers, that's a good question. Does having the luxury of serving your own draft beer mean you'll have to give up the convenience of bottles? Will it be harder to get your beer to everyone who deserves to taste it? Are you ready to abandon the personalized labels you spent so much time on? Last but not least, have you thought about the cost?

First, the advantages of kegging. Once you've gotten the hang of it, kegging is as easy, if not easier, than bottling. It's faster and less messy. Prep time is also shortened dramatically, because there's no need to accumulate, wash and sanitize bottles. Plus, a five-gallon keg takes up less room than two cases of beer. So it's easier to store.

Other advantages include clear-

er beer with just the right amount of carbonation. In fact, kegged beer can be force-carbonated in a pinch, meaning a keg of not-yet-fully conditioned beer can be ready to drink in just a few days, rather than waiting weeks. If properly handled and maintained, there's less chance of contamination with kegged beer than there is when dealing with individual bottles and bottle caps.

You don't need to be an advanced brewer in order to keg your beer. Extract or partial mash beer is kegged the same way as all-grain brews. With all these pluses, why is kegging such a dilemma for many homebrewers?

Cost is probably the main reason. A portable draft system will cost about \$200, which is a big consideration for many hobbyists. And that's for a basic system. If you

want to keep your beer permanently cold and on tap at home, add to that \$200 the cost of a refrigeration unit and additional hardware.

Another consideration is that the equipment must be well maintained. For example, you'll need keep the CO2 tank filled and periodically test its pressure, replace o-rings and gaskets when necessary, and occasionally clean the lines or add new ones.

All that aside, kegging is the next logical step for homebrewers. It's one of the things that separates the amateurs from the pros.

What? You still haven't run out and purchased your draft system? If the idea of not having bottles to hand out to friends is the major stumbling block, consider this: Yes, you can bottle directly from your keg. (The concept of counter-pressure bottling will be discussed in the second part of my kegging series, which will run in the May issue of *Brew Your Own*. Check the "Techniques" department.)

Basically, the kegging process is a simple one. Instead of bottling, beer is siphoned into a sanitized keg. The siphon hose should be long enough to ensure a splash-free transfer. Although many keggers like to "force-carbonate" their beer by adding a good infusion of carbon dioxide, many others prefer to prime kegs as they would bottles and allow the beer to carbonate naturally. The only difference is that you only use 1/3 cup of priming sugar for five gallons. (If you plan to

bottle your beer from the keg, the usual 3/4 cup should be used.)

When the keg is full, replace the lid and secure. The keg should then be pressurized enough to seal the lid securely. As with bottled beer, the keg should be put away for two weeks for conditioning. When the keg is tapped, the initial serving or two will contain some sediment, while the rest of the beer should be beautifully clear.

Initially, applying pressure to the headspace above the beer prevents air from getting in and oxidizing your homebrew. After serving, applying some head pressure keeps a keg fresh, and allows the beer to be easily dispensed.

Anyone who has ever "saved" a keg of commercial beer after a party knows enough to expect flat, stale beer on the next day. That's because using a hand pump causes the beer to be displaced with air.

With a CO2 system, on the other hand, the beer is displaced by carbon dioxide, allowing it to be enjoyed in its original condition over long periods of time.

A Basic Keg System

A standard keg system includes the following components.

Carbon dioxide tank: Tanks come in a range of sizes, but the five-pounder is perfect for the homebrewer. It's small enough to be easily carried yet has enough capacity to run approximately 10 kegs. Of course, that's if the tank is treated properly. Not all homebrew shops have the ability to fill CO2 canisters, but tanks can be filled at any welding supply shop.

Two-gauge regulator: Another must. One gauge indicates the volume of gas in the tank, the other is used to indicate the amount of pres-

sure being used. Both the CO2 tank and the regulator can be purchased at a welding supply shop, or at many homebrew shops. Because you'll need other equipment as well, it makes sense to find a full-service homebrew shop that can meet all your kegging needs.

Kegs: The keg of choice for most homebrewers is the Cornelius keg, also referred to simply as a soda keg. "Cornies" are available in 2.5 and 5-gallon sizes. These kegs are readily available and can be bought new or reconditioned. The keg should be intact, with all its fittings, o-rings and gaskets. The lid should fit securely and have a pressure release valve. (When buying a reconditioned keg, give it a quick sniff. If it smells like soda, no amount of cleaning will help. Either pass on that particular keg, or, if you insist on buying it, replace all the rubber gaskets and o-rings.



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CIRCLE 30 ON READER SERVICE CARD

These are available at most homebrew supply stores.)

There are basically two styles of soda kegs available—ball-lock and pin-lock—so you'll need to buy the appropriate fittings. Ball-lock fittings simply snap on to the keg's inlet or outlet. Pin-lock fittings must be pushed down and twisted. The distinction should make no difference to the homebrewer. However, if you're purchasing additional kegs, you'll want to stick with the same style so you don't have to buy another set of fittings.

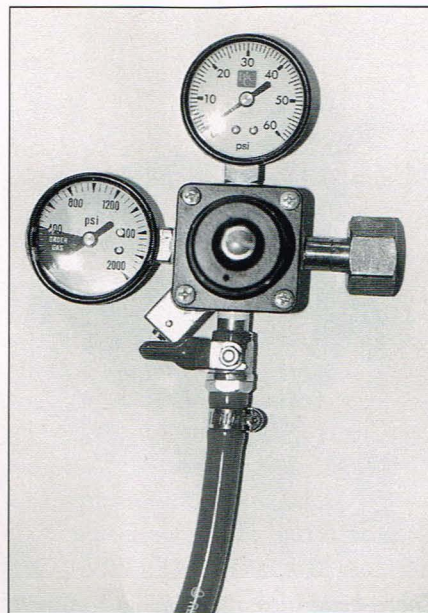
Some homebrewers use commercial kegs for their brew, although they are more expensive than Corny kegs, require special equipment for proper cleaning, and use more expensive couplers (taps).

Lines and fittings: You'll need a pair of poppets, discussed above, in either ball-lock or pin-lock style. (Gray is for gas, black is for beverage.)

Next, buy two lengths of vinyl or polyethylene beverage hosing. Generally, thick-walled hosing is used for gas, while smaller-diameter hosing is used for beer.

Although opaque lines are available, clear tubing allows you to inspect your lines visually. Buy lines of a sufficient length so you don't come up short. You'll also need a supply of inexpensive clamps. Because you'll eventually need to make repairs, perform maintenance or change your lines, adjustable worm clamps are better than permanent clamps.

Now you'll need some means to dispense your beer. A small, inexpensive plastic faucet, usually referred to as a "cobra head" because of its shape, will do just fine. The cobra head attaches directly to the beer line. A note: Hose sizes of 5/16-inch or larger may cause CO2 breakout in the line



This is a standard two-gauge regulator. One gauge indicates the volume of gas in the tank. The other is used to measure the amount of pressure being used. Both the CO2 tank and regulator are available at homebrew shops.

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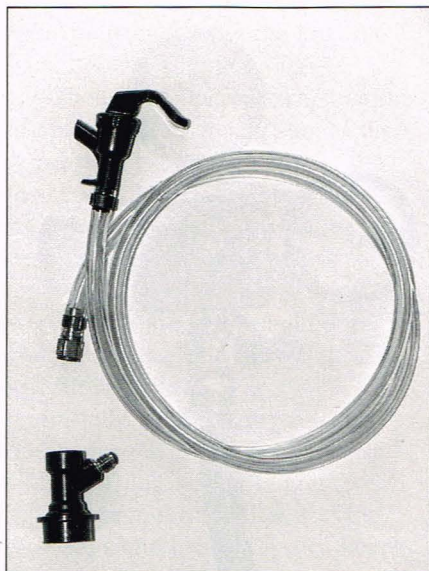
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Cobra-head taps often have a 3/16-inch barbed end that fits 3/16 hose well.

and foaming when you dispense the beer. The cobra head tap, also called a picnic tap, typically has a 3/16-inch barbed end that fits 3/16-inch plastic hose quite well.

Additional equipment: If your goal is to have your own homebrew always at the ready, you'll need some additional equipment. You can duplicate the refrigerated tap systems on the market for a fraction of the cost. First, you'll need a refrigerator large enough to hold your keg and tank. Keep in mind that a straight-sided keg takes up less space than one with rounded sides.

After drilling a hole at a convenient point, use the inexpensive cobra head to dispense your beer. If you want a professional look, buy a beer faucet that can be mounted on the outside of the refrigerator.

Filling Your First Keg

If you're priming your homebrew in the keg, like you would in a bottle, here's what to do.

1. Sanitize all the equipment you plan to use, including the sec-

ondary bucket, keg, keg lid and gasket, siphon setup and spoon.

2. Bring to a boil one-third cup priming sugar and one cup water, stirring occasionally. Boil this mixture for five minutes.

3. Siphon beer quietly from the fermenter to a sanitized five-gallon bucket or carboy.

4. Add priming sugar and stir the liquid gently with a large sanitized spoon. Cover lightly with a piece of plastic wrap.

5. Place full secondary bucket on counter, or any other surface that is higher than your keg.

6. Position a sanitized Corny keg below the bucket.

7. Make sure your siphon hose is long enough to reach well into the keg. You can even trim the bottom of the hose at an angle to further aid a quiet transfer.

8. Siphon the entire contents of the bucket into the keg. Replace the top and close.

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Quasi Kegs for \$50 and Less

There are several inexpensive "kegging systems" available to homebrewers. The main difference is that they do not use a CO2 tank and regulator, the most expensive components of a draft system. Many homebrewers swear by these convenient, inexpensive devices, while others insist only a full-scale draft system will do. Homebrewers who try these systems may find they meet all their kegging needs. Or they might whet your appetite for a bigger kegging set-up.

Some of the popular items on the market include:

Party Pig Beer Dispenser: Lightweight and compact, the Party Pig holds 2.25 gallons of

beer. It is lined with a self-inflating pouch that maintains carbonation. It fits easily in the refrigerator. A fresh pouch is required each time it is filled. The Party Pig costs \$38, including all the reusable parts and two pouches. You also need to buy an "activation pump" for \$7.50. To order, call (303) 279-8731.

The Medicine Rock Keg System: It holds 2.5 gallons, looks like a small beer ball and fits in the refrigerator. The "beer ball" itself is reusable. Unlike the Party Pig, beer is dispensed using a pump. Cost aside, they're ideal for home brewers who want to "keg" half their batch and bottle the other half. The 2.5-gallon system

costs \$29.99 for the keg, cap and seal (you can buy a second set-up for \$16.99). Call (800) 682-5228.

The Phil Tap: The Phil Tap attaches to a standard 1.3-gallon (5 liter) metal mini-keg, which you can find at a homebrew supply shop. You siphon in the beer, add priming sugar and replace the keg's bung. Attach the Phil Tap each time you dispense beer; the set-up includes a plastic cobra head, a pressure valve that snaps into the bung and a CO2 cartridge. The tap costs \$50 and comes with two cartridges and a wooden stand for the keg. (You can buy replacement cartridges for less than \$1 at a store like WalMart.) (513) 731-1130.

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9. Attach gray gas fitting to inlet of keg. Set regulator to around 5 to 10 pounds per square inch (psi). Turn CO2 tank on until you can no longer hear CO2 flowing. This will serve to create a good, tight seal on your keg. Pull the release valve on the keg lid for a second to make sure the keg is under pressure.

If you're force-carbonating your beer in the keg with CO2, here's what to do.

1. Skip steps 2, 3 and 4 (above). When artificially carbonating your beer, the use of a priming additive is not necessary. Repeat: Do not prime, or you'll end up with very foamy, over-carbonated beer.

2. After sanitizing your equipment, transfer beer directly from

your fermenter to your keg. Ideally, both your beer and your keg should be slightly chilled. About 60° F is ideal. Try not to jostle your fermenter too much when moving it around. Allow it a few minutes to settle before you begin siphoning. Follow the same siphoning method as described above.

3. When the keg is full and the lid is secured, inject CO2 as above. However, 25 to 35 psi should be used. Using your pressure-relief valve, slowly purge out the gas and repeat. By doing this, you will drive out any air left in your keg.

4. Place your CO2 tank and regulator at a level above the keg. The CO2 tank should still be on. This will avoid a backup of beer into your gas line.

5. Now agitate your keg. This can be done either by picking the

keg up, holding it at either end and shaking vigorously, or by laying it down on the floor and rolling it back and forth for five or ten minutes. This will dissolve and distribute the CO2. (It's also a good way to find out if your lid is on tightly).

6. Chill and let sit for a few days before serving.

If you follow these easy instructions, your first kegging attempt should go off without a hitch. For advanced kegging tips and techniques, check this column in the May issue. In the meantime, enjoy your homebrew ... on draft! ■

Gretchen Schmidhausler is the site brewer at Basil T's Brewpub and Italian Grill in Toms River, New Jersey. She wrote "The Age-Old Question" in the March issue of Brew Your Own.

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CIRCLE 10 ON READER SERVICE CARD

Marvelous Meritage

How to blend a red table wine from Bordeaux

by Alison Crowe

Home winemakers are a pretty independent bunch. We don't care what the "other" winemakers out there are trying to do (you know, the ones who make wine for money). Commercial winemakers sometimes have to make styles they don't even like, because "the tasting room needs a sweet Riesling" or "the market in Mississippi needs another dry Italian red." Home winemakers are lucky: We get to make whatever kind of wine we want.

We can, however, take inspiration from the many styles of wine being sold in the commercial marketplace. For me, one of the best commercial trends of the year to apply in one's home winemaking is a dry, red table wine style called the "meritage."

What Is a Meritage?

A meritage is a "new" phenomenon — really a re-discovered one — that has caught on in recent years with both commercial winemakers and wine drinkers. Meritages are red Bordeaux-style table wines that are constructed to be greater than the sum of their parts — and to be serious wines. The original concept of the "meritage" came, as its name might suggest, from the ancient winemaking traditions of France.

Here in the United States, we are accustomed to thinking about our wines based on their grape con-

tent (Cabernet Sauvignon or Chardonnay, for example). But in France the system relies on a set of geographical boundaries. Hence, when we think of great French wines, we think of the names of places (like Chablis or Burgundy) where those grapes are grown. It is relatively rare for the French to bottle a wine that is made 100 percent from one grape. Usually what we call a "Bordeaux" — or specifically, say, a Chateau-Lafite — is a blend of more than one kind of grape.

Because only certain grapes can be legally included in wines from a certain area or chateau in France, there are certain types of grapes that we expect to find in these blends. For instance, we lump the grape varieties that make up the fine red wines blended in the Bordeaux region of France under the term "Bordeaux varietals." These include some familiar names: Cabernet Sauvignon, Merlot and Cabernet Franc.

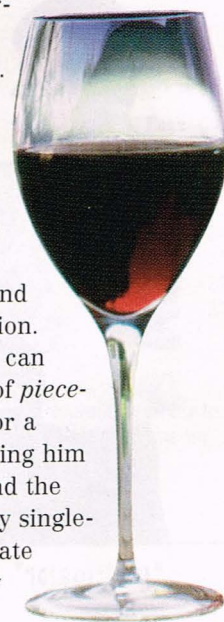
What we call "meritage" wines here in the United States are simply blends of various "Bordeaux varietals," sometimes with a little non-traditional grape thrown in for interest. A few commercial meritages that you can sample include: "Magnificat" from Franciscan, "Bearitage" from Gundlach-Bundschu, "Cain Cuvee" from Cain Five and "Isosceles" from Justin. Note the funky names; since meritage is a style, as opposed to a

grape or place, wineries find unique names for their own unique blends, just as home winemakers might.

Why Make a Meritage?

Commercial wineries make meritage blends for many reasons. Some want to create the "best wine possible" and believe that limiting your creative muse to one grape type is terribly stunting. One winery that takes this line of thinking straight to the winner's circle is the aptly named Opus One, created by the Mondavi and the Lafite-Rothschild families. Other wineries simply want to create a round, full, juicy wine that may be cheaper than their flagship Cabernet but is still an age-worthy wine to be contended with.

Whatever the motivation, these wines give vintners a chance to show off their fine-tuned palates and artistic expression. Meritage wines can become a sort of *piece-de-resistance* for a winemaker, letting him or her go beyond the usual, workaday single-wine lots to create something truly memorable.



Meritages are great wines for home winemakers to try for many reasons. We can make them from wines of various vintages that we may have lying around. If you've already got a few carboys of Cabernet Sauvignon and Merlot in the basement, get a Cabernet Franc or a Malbec kit and you'll have three classic blending components.

Another reason to make a Meritage is that blending is a great way to make the most of kits or single-variety wines that might not have come out as well as you'd hoped. If you've got a Cabernet Sauvignon with lots of tannin but no aroma, a Merlot with lots of fullness but no tannin, and a Cabernet Franc with a great, fruity aroma and a nice acidity, you can blend them all together and make up for what each individual one is missing. Keep in mind, however, that bad wines will never make good blends. Don't spoil twenty cases of wine just

because you wanted to get rid of a carboy filled with something awful.

On the personal preference side, for those of you who might not be all that into red wine or who "only drink Cabernet Sauvignon," meritage blends might be that "something new" you've been looking for. Meritages typically are made to drink now, to be fruity and accessible without being insipid. Even though they're probably going to improve with age, they aren't necessarily made to be cache collector's wines and they'll be as good tonight as well a few years from now. If you are just venturing into making red wines, then making a few kits and blending to your own specific tastes is a good way to end up with something you like.

How Do I Make a Meritage?

The key to making a meritage, as you might have guessed, is

blending finished wines together. The downside is that you need to have at least two lots (but maybe only a carboy of each) of finished, dry red table wine. The wines should be sound, stable, of approximately pH 3.35 to 3.8 and free of any obvious microbial activity. Wait until malolactic fermentation is over before putting your blend together. The wines can have had oak exposure and can be over a year old (but not too much older than that!).

A true meritage wine is usually some combination of Cabernet Sauvignon, Merlot, Cabernet Franc and Malbec. Not all of these wines have to be present for the wine to be considered in the "meritage style." Cabernet Sauvignon usually forms the backbone of the blend, but some fine meritages don't have any Cabernet Sauvignon in their blends at all.

If you haven't ever blended wines before, don't despair. It's real-

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ly a simple technique that requires only one thing: bench testing.

Bench testing may sound scientific and complicated, but bear with me. Remember, wines are complex chemical soups, and we can't expect them to be sloshed and mixed around with each other without their reacting to the fact that things are a little different.

For example, haze that was held in check in wine A might suddenly be coaxed out of solution when dispersed into the higher pH of wine B. That fruitiness that you loved in wine C might turn into something altogether horrid when combined with the A and B mixture. The moral of the story is this: wines blended with each other may not behave in predictable manners. This is why doing very small trial blends with only a few milliliters of wine at a time is critical. This is called "bench testing."

Testing, Testing

Bench testing requires only three things: Wine glasses, covers for those glasses and accurate devices for measuring small amounts of liquid (metric pipettes

and graduated cylinders are best).

The idea is to assess the wines you've got at your disposal. Think of ways that they might harmonize together. Try measuring different amounts of each and mixing them together in the glasses — don't forget to write down which proportions you've measured out! Cover with either a watch glass, petri dish half or simple plastic wrap. Swirl to mix. Sniff. Taste. Leave to sit for a few hours and observe again, this time looking for any funny hazes or precipitates. Pick the one you like best!

Multiply those percentages you wrote down so that the volumes seem to fit in with the volumes of wine that you've got available to blend. Before you go mixing barrels of wine together, however, don't forget to check the pH, TA and sulfur dioxide content (if you've added any) of the final blend. Make sure the blend you want will be stable.

Keep in mind that the blend you like best will most likely not use all of the wines you have available. Some may only use half of the Merlot you've got sitting around, but it'll use up all of the Cabernet Sauvignon. So be it! Such are the directives of blending!

After deciding on your blend percentages and doing the above analyses, mix your volumes in the appropriate amounts, bottle and let marry for at least a month. If your finished meritage doesn't end up tasting exactly like the bench test you remember doing, don't sweat it. Most professional winemakers recognize that larger volumes made from minuscule blending experiments almost never turn out to be an exact replica of that half-glass of wine they constructed months ago. Time, pH shifts and living in a corked-up bottle all will change the wine in subtle ways, making every blend a unique product of its components and its environment.

The important thing to keep in mind is that the goal of making meritages has always been to make a wine that is better than those wines it was built from. If you've accomplished that and you've got a wine that you enjoy, you've accomplished the meritage objective. ■

Alison Crowe graduated in 1998 from the University of California at Davis with a bachelor's degree in Fermentation Science. She works at Byington Winery in Los Gatos.

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Little Ricky's Brewery

A backyard cinder-block homebrew heaven

by Rick Marzullo



When Rick Marzullo spotted this building in the backyard, he bought the house.

My homebrewing hobby started in 1996, when my wife gave me a kit for Christmas. That first beer, an Irish red ale, tasted great at first. I guess the excitement of drinking my first beer sort of overwhelmed reality. After I drank a few more, I threw out the batch. Still, I loved homebrewing. Within a few months, I was into all-grain brewing.

In 1997, my wife and I went looking for a new house. I spotted it right away: a cinder-block building in the backyard, 20 feet by 20 feet, already outfitted with water and electric. I was pretty much sold on the house at that point. The wheels

started turning and I could see the future: Little Ricky's Brewery. We bought the house.

I'm not a guy who does anything halfway. Sometimes I get in over my head, but I figure, what the heck. You only live once. This has been my philosophy about Little Ricky's.

The centerpiece of Little Ricky's is my new 20-gallon, three-tiered brewing system. I bought it from a company in Concord, California, called Beer, Beer, and More Beer. The mash tun is on top, with the hot-liquor tank below it. Water is pumped up to the mash tun, and then is gravity-fed from the mash tun to the boiling pot. Above the system, I installed a range hood to vent the steam and propane fumes.

I also have a grain mill that I mounted to a counter-top and attached to some air-conditioning ducting. The grain falls through the duct into a large bucket on the floor. I can crush enough grain for a 20-gallon batch in about 20 minutes.

Next I installed a laundry sink and plumbed in two faucets. It's big enough to clean my five-gallon kegs and wash everything. Both faucets

have filtered water and I can run a hose to the brew system.

Next on the tour: My chest freezer, with an external thermostat to regulate the temperature for fermenting and lagering. It can hold enough glass carboys to finish a 20-gallon batch, plus a few Corny kegs. My favorite part of the room? An old refrigerator that I converted. I have a 20-pound tank that supplies carbon dioxide through a manifold that branches out to five kegs. I mounted taps to the outside, so it's easy to pull a draft!

I brew about 200 gallons a year, the legal max for a two-person household. I'm almost afraid to say what I've spent on Little Ricky's. My wife will realize I went too far! (The whole set-up cost \$3,500.)

As you can see, I've expanded my brewing a lot since starting out with a kit and a three-gallon pot. I'm not saying you can't brew great beer with that, because you can. As long as you're brewing, that's all that matters. Life is good. ■

Rick Marzullo lives with his wife and his brewery in Humble, Texas.



The ultimate beer fridge: CO2 runs through a manifold to five Corny kegs.



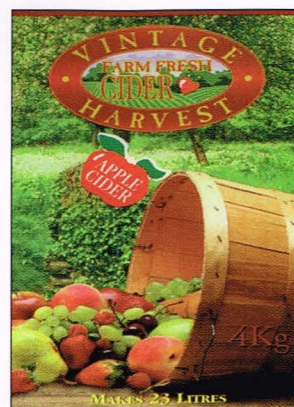
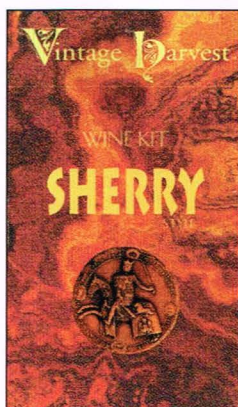
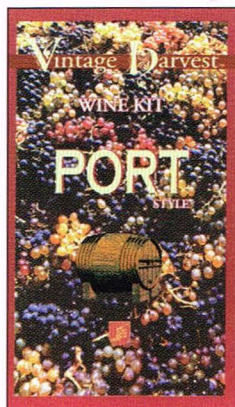
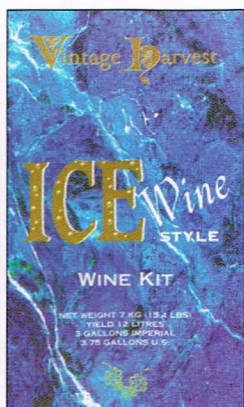
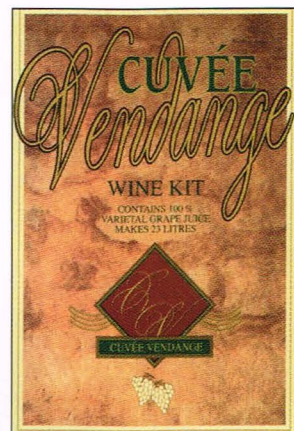
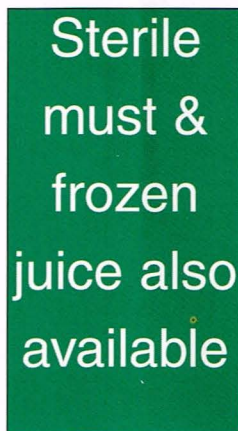
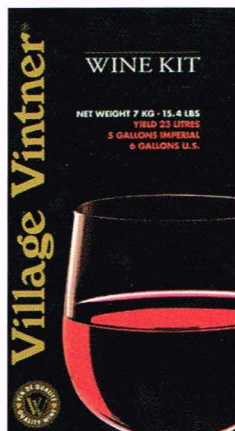
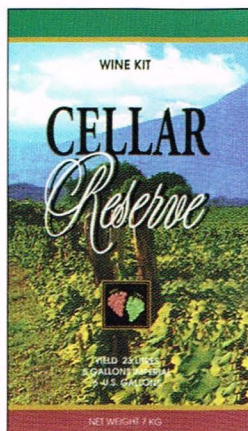
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Vinotheque — Supplying some of the finest home wine & beermaking supplies for over 25 years!



She doesn't want to hurt his feelings, but...

Jim's been brewing for years now. In his garage, at any one time, he'll have as many as 6 different beers on the go.

In Jim's eyes, he's done everything right. But when it comes to the taste, something is very wrong. Karen knows. And so she should. She's been his guinea pig for the last 8 years.

But Karen's been reading while Jim has stood still. She's discovered that there's a whole lot more to making great beer than dated theory and blind hope.

Karen knows that brewing ingredient technology has moved on apace. Better grain malts, better liquid extracts and spraymalts, better kits - all mean that fine beers can be made easily, with perfect results every time.



Every good brewer knows that the golden rule for great tasting beer is quality ingredients.

When it comes to quality, you need look no further than Muntions. Generations of experience means we know a thing or two about great malt - that's why we supply some of the world's most famous breweries.

You can get all that Muntions' know-how in grain malt, liquid extract, spraymalts, yeast and a whole range of beers in kit form - all from your local brew store.

All very good for brewing but poor Karen still has to break the news to Jim...

If you don't already know Muntions, ask at your nearest brew store. They do.

Muntions
A WORLD OF DIFFERENCE

GRAIN MALTS • LIQUID MALTS • SPRAYMALTS • BREW KITS • PLAIN & HOPPED MALT EXTRACTS
CIRCLE 25 ON READER SERVICE CARD