

Brew

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Niche Publications Inc.

THE HOW-TO HOMEBREW BEER MAGAZINE

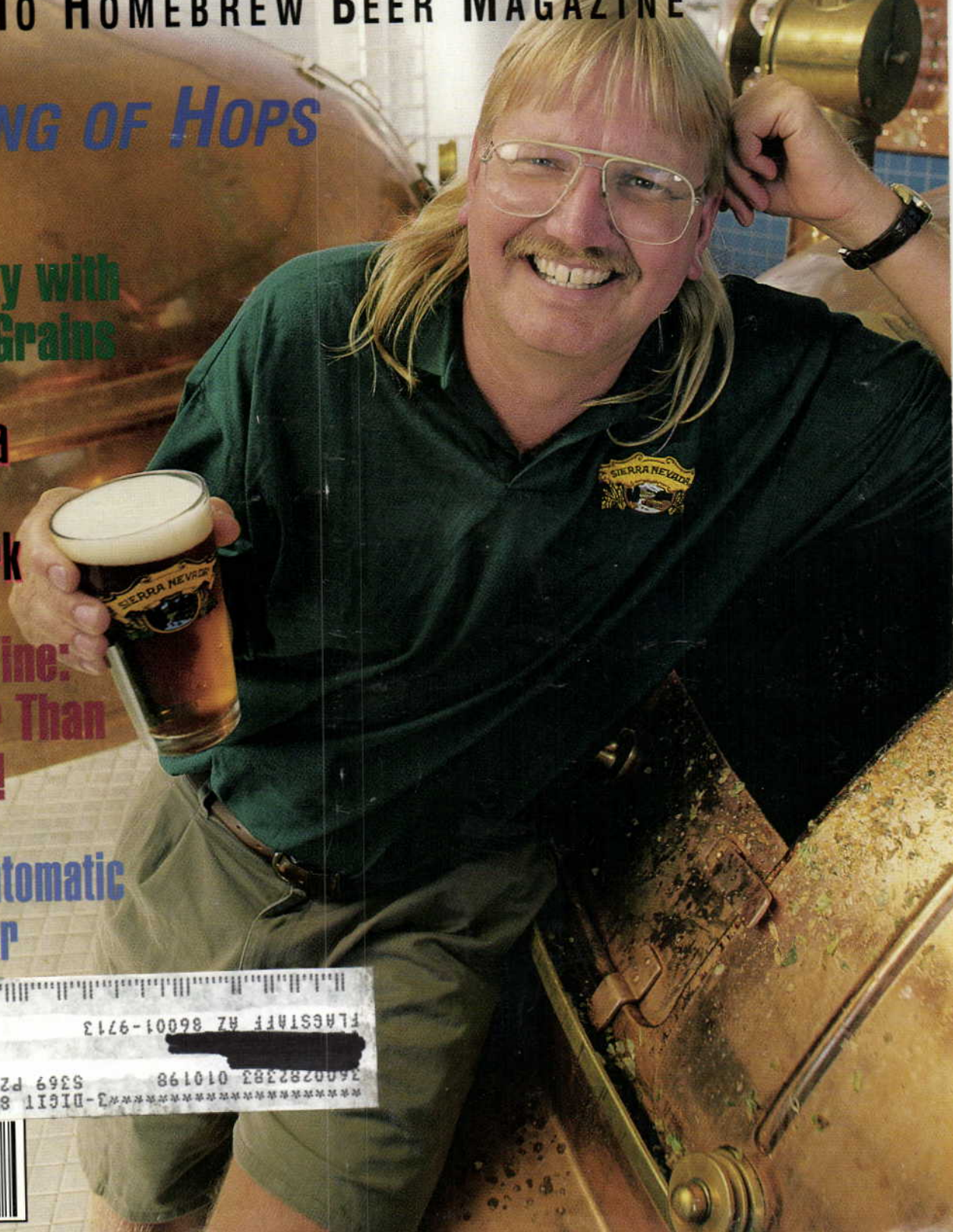
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Final Program Update!

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- After the keynote address, choose either a **restaurant** or **brewery** track for your first session.
- Further tailor your program in afternoon workshops. Choose from four tracks:
 - **restaurant**
 - **brewery**
 - **management**
 - **startups**

Attention Entrepreneurs:

This conference is ideal for entrepreneurs who want to start a new brewpub or micro-brewery.

Morning

Registration (7:30-9:00)
Keynote Address (9:30-10:30)

- **The Brewpubbing of America: Building Business in the Changing Marketplace**

First Sessions (10:45-12:00)

Restaurant Session

- **The Profit(able) Secrets of Chain Restaurants**

Brewery Session

- **Going High-Tech: The Latest Brewing Technology**

Keynote Address (9:00-10:00)

- **Redefining the Brewpub Concept**

First Sessions (10:15-11:30)

Restaurant Session

- **Improving Profitability in the Restaurant**

Brewery Session

- **Maintaining Consistency in the Pub Brewery**

Lunch (12:00-1:15)

Lunch (11:30-12:45)

Afternoon

Early Registration
(3:00-6:00 p.m.)
early registration and check-in

Afternoon Workshops

#1 (1:15-2:45)

Restaurant Workshop

- **What Your Staff Should Know: Elements of a Successful Training Program**

Brewery Workshop

- **Cask Conditioning**

Management Workshop

- **Planning the Perfect Promotion, with 50 Promotional Ideas**

Start-ups Workshop

- **Buying Brewing Equipment**

Afternoon Workshops

#1 (12:45-2:15)

Restaurant Workshop

- **Automation and Innovation: The Latest Restaurant Advances**

Brewery Workshop

- **Get the Most Out of Your Mash Tun**

Management Workshop

- **Building Distribution**

Start-ups Workshop

- **Working With the ATF and State Agencies**

#2 (3:00-4:30)

Restaurant Workshop

- **Cost-Effective Menu Design**

Brewery Workshop

- **Advanced Yeast Handling**

Management Workshop

- **Negotiating Tactics That Work**

Start-ups Workshop

- **Site Selection**

#2 (2:30-4:00)

Restaurant Workshop

- **Food and Beer: New Ideas for the Creative Chef**

Brewery Workshop

- **Restaurant/Brewery Coordination: What Every Brewer Should Know About the 'Other' Side of the Business**

Management Workshop

- **Bottling Options for Brewpubs**

Start-ups Workshop

- **Brewpub Design for Startups**

Roundtable (4:45-5:45)
Fabricators Forum: Addressing Brewpub Equipment Needs

Roundtable (5:45-6:45)
Tactics to Win Publicity

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Welcome Party
(7:00-9:00)

Brewpub Excursion
(7:30-10:00)

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If you understand the fundamentals of mash temperature and heat transfer calculations, you can mash with style and accuracy.
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Build a clean-in-place system for your kegs. All you need are a few basic materials. The result is simple, elegant, and inexpensive.



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Playing Favorites

Recently my brewing partner asked me this question: "What's your favorite brewing ingredient?"

Admittedly, we were just hanging out during the boil enjoying a couple of beers. At times like this we've discussed the important questions of our times, from the quality of local politicians to the suitability of Madonna's sperm donor. Naturally, we've debated many questions regarding beer and brewing, such as which beer style is best and which beer brand rules.

Still, even under these circumstances his question seemed odd, and I told him so. "That's a ridiculous question."

He "politely" disagreed, and we spent the next five minutes or so arguing about whether a person could have a favorite brewing ingredient. (He thought he had me cornered when he got me to admit that most people liked "the chips" best in chocolate-chip cookies.) That particular debate ended when he announced, "Mine's hops."

It was a challenge. He was throwing down the gauntlet, and he knew I couldn't resist responding.

"Hops? Dried leaves! Yeast's a much better ingredient."

Him: "Yeast? A bunch of bugs."

Me: "Figures you'd like hops. Appealing on the outside, bitter on the inside."

The game was on. We spent the next half hour creating a top-10 list of reasons the best ingredient in beer is yeast/hops.

10. Growing hop vines fights the greenhouse effect.
9. Yeast is more fun to recycle than aluminum cans.
8. You never have to worry about getting "wild hops" in your beer.
7. You can't "over-yeast" beer.
6. Hops make a good holiday decoration when you're short of mistletoe.
5. Yeast are a dieter's dream: They eat only sugar and stay perfectly

healthy.

4. Using hops reduces those bills for aroma therapy.

3. Yeast prove alcohol and sex do mix.

2. Hops are better than baking soda for clearing out those nasty refrigerator smells.

1. When yeast practice heavy breathing, everybody benefits.

Just as things were really getting hot and heavy the boil ended and we had to go back to the task at hand. We decided to declare it a draw and call in an expert. That's why this month's cover feature focuses on Steve Dresler, the one-time homebrewer who is brewmaster at one of the country's top breweries, Sierra Nevada Brewing Co. Steve not only reveals his favorite brewing ingredient, he shares inside information about Sierra Nevada's brewing process, offers tips for homebrewers, and even gives suggestions for anyone trying to brew a Sierra Nevada Pale Ale clone at home.

So is Steve a hops adherent or a yeast advocate? You'll have to read the article for yourself (page 32). But when you find out, don't mention it to my brewing partner.

For more on the topic of brewing ingredients, don't miss Jeff Frane's article on using specialty grains (page 24). He provides lots of information on the role of specific grains in beer styles along with practical ideas on using specialty grains in your beer.



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Brewing in the Bath

Dan Hill
Augusta, Ga.

I wanted to share an experience to warn others of certain things *not* to do when brewing a batch of beer.

I was attempting to make a Belgium Trappist Ale. I had the right recipe and the right yeast, and was really hoping for a wonderful beer in a couple of months.

About 50 minutes into the boil (this includes the decoction time for the grains I was using) one of my cats knocked my 22-ounce bottle of carefully propagated yeast off the kitchen counter (never let your cat near your brew). This threw the airlock across the room and spilled about half of my yeast culture. I managed to rescue the rest of the yeast. I called my local brewmeister, who told me that I still should have enough yeast for the batch.

I continued working with the wort. Once I completed the cooking process, I began transferring my wort to the fermenter. Now things really got bad!

My wife and I live in a small two-bedroom apartment with two baths, so I have to use one of the bathrooms to ferment my beer. Well, I walked the

hot wort into the bathroom, placed the fermenter into the bathtub, and proceeded to fill it to the five-gallon mark using a pulsating shower head on a hose that allows me to aerate the wort at the same time. Once I was at the five-gallon mark on the fermenter, I removed the wort from the bathtub. I placed the fermenter on the lowered toilet seat while I rinsed my fermenter cover. I never thought about the fact that the seat was not perfectly flat!

While my back was turned, the fermenter slid off the toilet seat, striking on its base (never put a fermenter on top of a toilet seat). Well, if you have ever seen what happens when you drop a bucket of something onto the floor, you know about the explosion that took place! Heated wort, Irish moss, and my dry hops proceeded to cover a good bit of the walls and floor of the bathroom.

I finished rinsing the top for my fermenter and placed it lightly on the container, which now held about 3.5 gallons of wort (should work better with the smaller amount of yeast, right?) and went into our laundry room for some old towels to start cleaning up

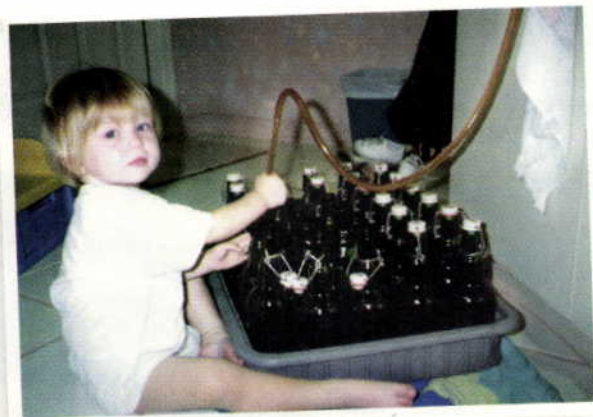


Dan Hill learned a slippery truth about brewing in the bathroom.

the mess I had made. Not thinking, I placed a couple of the towels on top of the fermenter (there was no airlock on it at this time) and proceeded to clean up my mess in the bathroom.

Once the majority of the cleanup was complete, I figured I would continue working with my precious wort. I removed the towels that I had placed on top of the fermenter and noticed quite a bit of fine dust, similar to what you might find around your clothes dryer. Well, upon removing the lid to the fermenter, I noticed some of this dust floating on my poor, abused wort! (Always have the airlock ready to go.)

What could I do? I flushed it, saying a prayer to the brewing gods as I did so.



Two-year-old Allie is a stickler for cleanliness. Her strengths include nap time, watching "Sesame Street," and bottle filling.

Nick Pepe
Tarpon Springs, Fla.

Here's the youngest brewmaster in our family, Allie, who has been watching her Daddy brew beer her whole life. In this picture she is bottling the batch she and Daddy brewed in honor of her second birthday: Allie Ale. We won't tell you her secret ingredients; she hasn't even told us yet. Once she's "of age" we think she's going to be a master brewer. She may even let us in on her secret ingredients. We'll let you know in 19 years.

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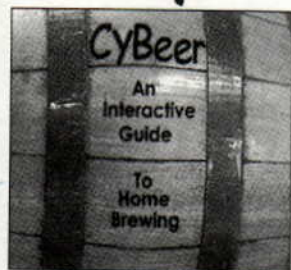
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Thanks for the Invitation

Dear Brew Your Own,

Well folks, I just received my July edition and read about your totally fun and happening anniversary party. I think I speak for all readers when I say I sure hope y'all had a lot of fun. Of course, it's not like *we* were invited or anything. Not like *we* could have brought the beer or munchies. Or not like *we* could have just dropped by to say "hi." Oh no! We get to read about the great gathering in a magazine article. Well, I guess *we* will just have to hold our own parties with "selective" invitations and such.

Anyway, congratulations on a fantastic magazine. I'm still a beginning novice, if that's even a designation. I'm having a great time learning about and attempting homebrewing. Your magazine just makes it so much easier. Now that you have my e-mail address, you can send my invitation to next year's party. And I must say, I can't wait.

*Tony Brown
Tucson, Ariz.*

Clone Your Own

Dear BYO,

I have a question about a recipe that appeared in Clone Your Own (July '97). I want to brew a batch of Chimay Cinq Cents. Here in Alaska I do not have access to two important ingredients: golden syrup and chimay cinq cents yeast. Is there anything else that can be used as a suitable substitute?

*Chuck Tucker
Aielson Air Force Base, Alaska*

Although it won't be quite the same, you can substitute four or five ounces of light candi sugar for the golden syrup. If you can't find that you can use four to five ounces of corn sugar. However, you run the risk of off-flavors. As a substitute for chimay yeast, use Wyeast 3787 Trappist ale yeast.

Recipe Rewrites

Dear BYO,

Regarding Recipe Exchange (June



'97 BYO) please advise readers not to follow the White Russian recipe exactly.

Being the experienced brewer I am and the owner of a brew-supply shop, I have learned to question recipes.

The question came up when I dry hopped the batch. In looking over the recipe for how much Creme De Cacao to add I found that you wanted it to be added at bottling. Creme De Cacao is mostly sugar or other sweeteners, so this raised a large question. If I used the standard bottling sugar as called for and added the Cacao, just how much carbonation am I going to get? Not wanting to take any chances I added the Cacao at the dry-hopping stage.

Within four hours I had the prettiest true secondary fermentation with a three-inch head you could ask for. This lasted for 36 hours. Had I followed directions I'm absolutely positive that there wouldn't have been a single bottle survive that pressure. The batch has turned out well, in spite of the secondary fermentation.

*Robert L. Carr
Muggsy's Brew Shop
Jefferson City, Mo.*

You are correct. Use either the cordial or priming sugar but not both.

Dear BYO,

I just received the July edition and, being a lover of brown ales, turned to the Style of the Month section to check out the brown ale recipes. I believe that the "Dark Streets of London Brown Ale" (all-grain) recipe has a slight typo.

The ingredients list 6 oz. Northern Brewer hops for 60 minutes. I think it should be 0.6 oz. as in the extract recipe. Six ounces of Northern Brewer would create some "bitter beer faces," the likes of which would make those in the commercial look pretty.

*Wes Bollman
Livonia, Mich.*

Thanks for the correction. It should have read 0.6 oz. of Northern Brewer.



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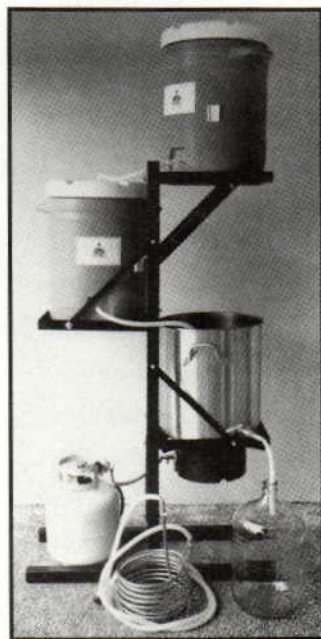
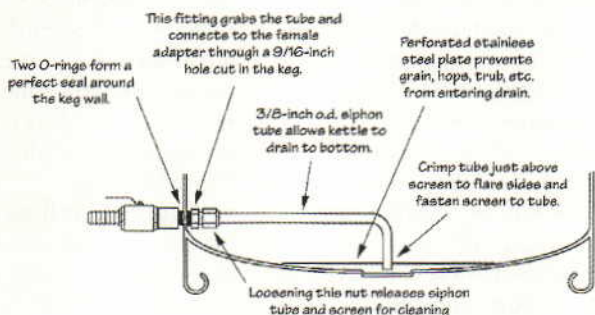
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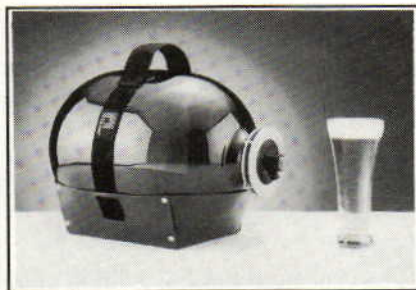
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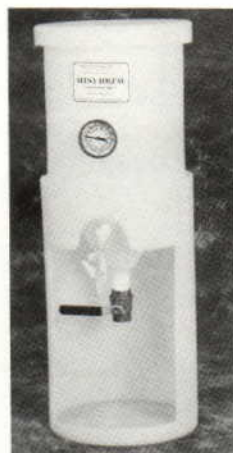
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The Art of Brewing Fearlessly

by Scott R. Russell

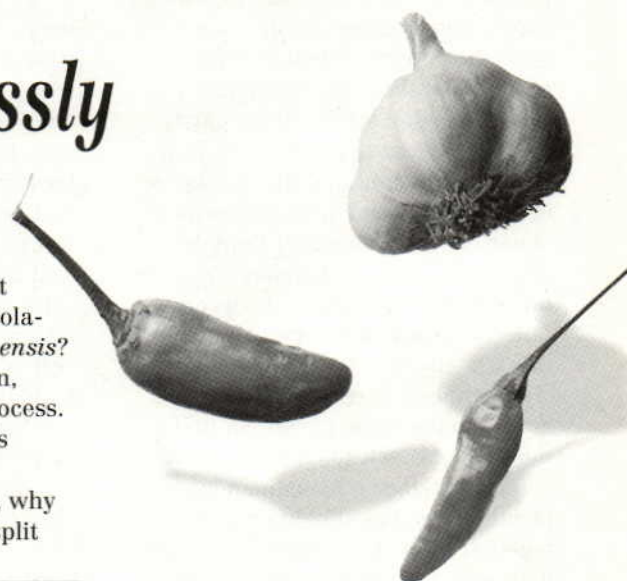
"...because fear is never boring."

— Julian Zelazny
award-winning brewer
and master beer judge

Complacency is our enemy, friends. When we stop taking risks, oh yes, we get dull. Not hopelessly but dull nevertheless. I mean, look at us. We make our own beer. That's a risk. Lots of things

could go wrong. But when it all comes together, isn't it just about the best thing since...since the isolation of *Saccharomyces carlsbergensis*? Lots of reasons to brew your own, right? Control. Economy. The process. Pride. Dissatisfaction with what's available. Fun.

Fun? Oh yeah. If it's not fun, why do it? I guess I've kind of got a split



Quaffer-then Barleywine (5 gallons, partial mash)

The name comes from the restaurant scene from Monty Python's "The Meaning of Life."

Ingredients:

- 1 lb. crushed pale malt
- 0.5 lb. dark crystal malt, 90° Lovibond or more
- 0.5 lb. crushed malted wheat
- 1 lb. crushed victory malt (or toasted amber or mild ale malt)
- 3 cans (3.3 lbs. each) Edme Maris Otter plain light malt extract
- 2 lbs. plain light dry malt extract
- 2 oz. Northern Brewer hop pellets (7.5% alpha acid), for 60 min.
- 1 oz. Target hop pellets (8% alpha acid), for 30 min.
- 1 oz. Challenger hop pellets (8% alpha acid), for 30 min.
- 0.5 oz. whole East Kent Goldings hops, for dry hopping
- English ale yeast
- 10 g. dry champagne yeast
- 1 cup homemade spice tea (see note)
- 1/2 cup corn sugar for priming

Step by Step:

In 2 gals. of water at 167° F (will settle to 154° F or so when you mix in the crushed malt), mash malts and malted wheat. Hold for 90 minutes. Sparge with 2.5 gals. water at 168° F.

Add extracts. Bring to a boil. After 30 minutes add Northern Brewer pellets. Boil 30 more minutes and add Target and Challenger pellets. Boil an additional 30 minutes. Remove from heat, throw in 0.5 oz. East Kent Goldings hops, and chill. Top off in fermenter with chilled, pre-boiled water to make 5.25 gals. When wort cools to 75° F, pitch at least 2 qts. of English ale yeast slurry (build up ahead of time in a hopped wort!). I prefer to use Wyeast 1098, but the new Pitch5 system English Ale yeast from YeasTech Laboratories would do nicely as well.

Ferment at 70° F or so for 10 days. Rack to secondary and add dry champagne yeast. Condition cool (50° F) and in the dark for four weeks or until gravity is under 1.026. Prime with corn sugar and add spice tea. Bottle and age (patiently!) for at least 12 weeks, more if you can wait. Save a few bottles for a long time to trace the patterns of the spices. The potential alcohol content is as high as 9.6 percent, depending on yeast performance.

Approximate OG = 1.099

Brewing Notes

Spices: Make a spice tea by

soaking a pinch each of the following spices in a cup or so of boiled water: woodruff, black pepper, vanilla bean, yarrow, and rosemary. (Try it, you'll like it!)

All-grain recipe: What, are you kidding? Can you comfortably mash 16.5 lbs. of malt? Can you afford to, both economically and time-wise? So be it: 14 lbs. Crisp Maris Otter pale malt; 1 lb. crystal malt, 90° Lovibond; 1 lb. victory malt; and 0.5 lb. malted wheat. Mash 75 minutes in 5 gals. water at 154° F and sparge with 6 gals. at 168° F. Boil to reduce to 5.25 gals., following the hop schedule as above. And good luck. Be sure to do an iodine starch-conversion test.

Obviously, there are ways to compromise. Each can of extract in the first version of the recipe can be replaced with about 3.5 lbs. pale malt. I'll let you do the calculations for your adaptation.

All-extract version: Steep the crystal, wheat, and 0.5 lb. of the victory malt in the brew kettle containing 3 gals. of water. Raise temperature to 170° F and remove the grains. Add extracts as above plus an additional 1 lb. light DME (or swap all the DME for 1/4 can of Maris Otter extract, if you want to make this a \$55-plus brew).

personality when it comes to brewing. I try to brew along classic style guidelines, partly because I like certain classic styles (Scottish ales, stouts, Belgian strong ales), partly because I want to prove I can do it. The other part of me, though, keeps echoing my friend Julian's words: "Fear is never boring." I think he means that even if it comes out bizarre, outrageous, wild, "wrong," at least it's not ordinary. (After all, this is a guy who used kidney beans, chili peppers, garlic, licorice, and ginger in the same brew). So that's the way I brew it too, sometimes.

Put together odd components, blend things that shouldn't work together (they do, though, more often than not). Like this month's recipe. A spiced barleywine. Yes, I know, it's late summer, it's hot outside, you don't even want to think about something heavy and strong like a barleywine right now (got any of that weizen left?) but now's the time to brew it so that it'll be ready in March.

Now, big brews such as barleywines are already outrageous, in a way. They're filling, rich, substantial, a balance of sweet and bitter but above and beyond almost anything else. Flavors blend, swirl, fade, come back out as the beer matures, ages, and evolves. Stuff (including people!) can get lost in a big barleywine. And there's not much place for subtlety. Sometimes, though, a discreet touch, a detail, can turn "great" into sublime. That's what happens here.

Just when you thought you couldn't fit anything else, any more flavor or complexity, into a beer! My blend of spices is designed to evolve with the beer — some will dominate the young brew and fade with age. Others will be almost unnoticeable at first, then will come out of nowhere after several months of conditioning. And as always, your recipe modifications are just as appropriate as mine. Because that's another reason we homebrew: individuality.

Reader Recipes

Brews Brothers' Jake's Honey Ale (5 gallons, extract and specialty grains)

This recipe was adapted from Charlie Papazian's recipe for Rocky Raccoon's Crystal Honey Lager. This brew is great on the beach, in a boat, or while cutting the grass. In winter be creative with it because it will accept almost any additional ingredient. If you can wait until it's been in the bottle for about a year the change is delightful.

Larry Bogart

The Brews Brothers of Mystic
Mystic, Conn.

Ingredients:

- 0.5 lb. flaked wheat
- 3.3 lbs. John Bull plain light malt extract
- 3 lbs. unpasteurized honey such as wildflower
- 1.5 oz. Northern Brewer hops (7.5% alpha acid), for 60 min.
- 1 oz. Willamette hops (3.7% alpha acid), for 5 min.

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- 1098 British Ale Yeast
- 2/3 cup corn sugar for priming

Step by Step:

Steep flaked wheat in 2 gals. of cold water and slowly bring to boil. Remove wheat when water boils and discard. Add malt extract and honey, boil for 10 minutes (or hot break), and add Northern Brewer hops. Boil for 55 minutes and add the Willamette hops. Boil for five minutes more. Turn off heat. Cool and transfer to primary, adding cold water to make 5 gals. Pitch yeast at 75° F. Transfer to secondary after five days. Ferment to completion and bottle.

Chocolate Cream Stout

(5 gallons, extract and specialty grains)

This stout was designed as a beer to relax with after a good meal or hard day at work. It is especially enjoyable on a cool night with a fine cigar.

Warren Lewis
Panano Creek Brewer Supply
Tucson, Ariz.

Ingredients:

- 6.6 lbs. dark malt extract, 80° Lovibond
- 0.5 lb. flaked oats, 2.2° Lovibond
- 0.25 lb. chocolate malt, 450° Lovibond
- 0.25 lb. crystal malt, 60° Lovibond
- 0.125 lb. roasted barley, 550° Lovibond
- 0.125 lb. black barley, 550° Lovibond
- 0.25 lb. dark Munich malt, 13° Lovibond
- 1.5 oz. Bullion hops (9.1% alpha acid), for 45 min.
- 1 oz. Kent Goldings hops (6% alpha acid), for 10 min.
- 4 oz. lactose
- 1.25 cups Droste Dutch cocoa powder
- 1084 Irish Ale Yeast
- 5 oz. sugar for priming

Step by Step:

In 1 gal. of water steep grains at 155° F for 30 minutes. Pour into strainer and sparge with 1.5 gals. at 170° F. Add extract and cocoa powder.

Bring to a boil and add Bullion hops. Boil 35 more minutes and add Kent Goldings. Boil 10 minutes more. Total boil is 45 minutes. Remove wort from heat and let cool for 15 minutes. Mix into 2.5 gals. of cold water in primary fermenter. Add yeast when wort is 75° F. At bottling time add priming sugar and lactose to 1 cup of water and bring to boil. Allow to cool to 76°, add to wort, and bottle.

OG = 1.050

FG = 1.014 ■

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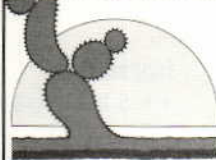
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Performance Anxiety

Mr. Wizard

I brewed a batch using Bierkeller light and Laaglander dry malt extract. At the right temperature I pitched Wyeast European Ale yeast, which was activated two days before I brewed. The bag was ready to burst. No less than 48 hours after pitching I still have no activity in my wort. In fact by looking at the airlock, it would appear that my wort is attempting to draw air in! What should I do?

*Bill Kunz
Oshkosh, Wis.*

There are three major problems that could delay the onset of fermentation: pitching dead yeast, pitching live yeast then killed by hot wort, and pitching insufficient yeast (underpitching). Because your yeast packet was bulging at the seams the "dead yeast" explanation can be ruled out since dead yeast don't wear plaid, or something like that. It is possible, even though you claim otherwise, that the wort was too hot for the yeast. The fact that your airlock looked like it was gasping for air suggests this possibility, since hot wort creates a vacuum when cooled in a closed container.

The last possibility, and one that I find the need to harp on very frequently, is underpitching. Just because you had live yeast that produced enough gas to neutralize a few Tums doesn't mean there was enough yeast for a normal fermentation. Although I personally prefer liquid yeast to dry yeast, liquid yeast is a lot easier to underpitch than dry yeast because most homebrewers do not have an accurate method to assess the amount of liquid yeast added to the wort. Dry yeast is easily pitched by weight, and



14 grams per five gallons works very well. In my experience using liquid yeast, even the smack-pack types, I find that it greatly helps to do a propagation step before pitching. One pack added to 0.25 to 0.5 gallons of wort is a nice intermediate step before adding the yeast to a five-gallon fermenter.

The best advice I can give to prevent problems like this from re-occurring is to verify your wort temperature, aerate well, and pitch a good quantity of viable yeast.

Mr. Wizard

I recently brewed 10 gallons of an apricot ale that started at 1.062 and was down to 1.013 gravity before the addition of my apricots in the secondary fermenter. I was afraid that the beer was going to turn out too dry, so my neighbor suggested adding maltodextrin to it. He said maltodextrin added residual sweetness to the beer along with body. The local brewing-supply store only

had dextrin powder. When I tasted the dextrin powder, it smelled like dirt and tasted like corn starch, leading me to believe that the stuff was nasty and would not help the beer no matter what. Is there a difference between maltodextrin and dextrin powder?

*James Gregg
Phoenix, Ariz.*

It's been a while since the age-old debate about dextrans has come up. I must commend you on your palate! Smells like dirt and tastes like corn starch — mmm! mmmm! That really sounds like a palate builder. Jean de Clerck wrote about this debate in his classic treatise, *A Textbook of*

Brewing, originally published in French in 1948 and later in English in 1958. De Clerck noted through his own research that dextrans or maltodextrans (whatever you want to call them) do not add body or sweetness to beer as commonly claimed during his day. He argued, as many brewing scientists do today, that proteins and alcohol are the main contributing factors to mouthfeel. Today we know that gums, such as the beta-glucans, also are important contributors to body. Sweetness is mainly due to sugars, but alcohol is also an important compound affecting sweetness.

Your argument is in line with this seemingly timeless dispute among brewers. Dextrans, maltodextrans, limit dextrans, and belly builders are all names used to describe the unfermentable, starch-derived carbohydrates found in beer. There is no singular dextrin molecule but rather a group of compounds that typically contain four to 10 glucose molecules. These are generally termed "oligosaccharides," or many sugars, as opposed to the larger glucose polymers containing more than 10 molecules called polysaccharides. These sugars, like polysaccharides such as starch, are not very sweet as demonstrated by your taste test. In general large carbohydrate polymers are less sweet than smaller ones. This is all fact.

Now for the controversy. Many brewers still swear up and down that dextrans add body, sweetness, and foam stability. Some even claim that they can make your beer do the waltz. Needless to say, I am not a believer. According to numerous studies published in brewing literature, body is mainly affected by carbon dioxide, alcohols, protein, foam (skim the foam off of a pint of Guinness and be amazed or disgusted as the case may be), and gums. There is no good evidence that foam is stabilized by dextrans, and the waltz is certainly not going to be performed by many beers!

I also do not believe that dextrins are sweet. That is easily demonstrated. It is possible, however, for the residual dextrins in your mouth to be attacked by salivary amylases and converted into sweet sugars. This, in my opinion, is a plausible explanation that sheds some light on this whole issue. Many commercial brewers intentionally mash at high temperatures to limit fermentability of the wort and increase the final gravity for this very reason. One consequence is less alcohol, which will have its own effects on body and sweetness.

If I wanted sweetness in beer I would add sweet sugars, such as fructose or sucrose, filter the beer and, if possible, pasteurize it just to be sure no rogue yeast or bacteria could create bottle bombs. This process does sound industrialized but is the common commercial way to make sweet beers. Lindemann's Lambic beers, Mackeson Stout, and sweet ciders are some examples of such products.

The best way for you to resolve the

dextrin issue in your own mind is through experimentation. Happy tinkering!

Mr. Wizard

I have been brewing for about a year now and have applied many pieces of advice you have given. Thank you. About 10 months ago I tried making a mead and it came out terrific. I used store-bought honey (pasteurized), ginger, water, and yeast. Since the mead came out so well, I wondered how great it would be with fresh honey (unpasteurized). I purchased enough to make several batches. Unfortunately every batch I have made with the fresh honey has come out tasting medicinal. Several books claim this could be either a contamination problem or caused by not rinsing after sterilization. I tried boiling the mead for different times, not adding anything else that might contaminate my mead, and making sure all my TSP was completely washed off. But my mead still tastes like

cough syrup. Because I still make beer and it always comes out fine, I am confused as to what could be causing these off-flavors. Every recipe I have seen for mead always says fresh honey is best. Please help. I still have more than 20 pounds of honey to use!

*Keith Ludwick
Riverdale, N.Y.*

Cough-syrup mead is certainly not the best result when you've spent lots of money on high-quality honey. As you have read, most medicinal off-flavors in beer and mead are related to wild yeast and bacterial contamination. These strains convert certain phenolic acids into volatile and medicinal-smelling phenols. The culprit of these problems is usually wild yeast. If you use unpasteurized honey, there is no doubt that wild yeast are present. The only reason they do not ferment the honey itself is its very high sugar concentration, typically about 65 percent. However, when given a chance in a dilute solution such as wort, they will go

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to town and produce the off-flavors associated with wild yeast.

The puzzling part of your question is that boiling the unpasteurized honey did not eliminate the problem. Without knowing more about your process, the following is merely speculative. It is possible for yeast to survive a boil if the boil is too short, but this is unlikely.

Another possibility is spore-forming bacteria found in honey. These organisms form spores during growth and happen to be very heat resistant. The spores hang around for a rainy day. When exposed to certain environmental stresses, such as boiling, the spores are "activated" and begin to grow. It is possible for certain spores to survive *short* boil times, become activated, and start growing in the wort. This could cause spoilage. Long boil times will eventually destroy spores.

Another possibility is that you are using a brewing yeast strain that produces phenolic flavors. Some yeast strains, such as weizen yeast and Belgian ale strains, often produce quite a lot of this particular flavor and other yeast strains, for example certain English ale strains, produce low levels of phenolic flavors. If you changed the pitching yeast between your successful and unsuccessful attempts, the yeast could be the culprit. Along the same lines, you may have gotten hold of some contaminated yeast. In general dried yeast are more prone to contamination than liquid, and the classic "homebrew" flavor of years gone by was medicinal. This was caused by wild yeast contamination.

My suggestion, if you want to keep trying, is to try using pasteurized honey again. If the problem goes away, your problem is likely due to the microflora present on your unpasteurized honey. In this case I would recommend using a longer boil time for fresh honey. If this doesn't solve the problem, try switching yeast to determine whether there is an endemic problem with the yeast supply. If that still fails to work, I would seriously consider getting a new hobby or simply sticking to beer! Just kidding.

On a more serious note, parents of infants please read on. Unpasteurized or "natural" honey (I hate that term;

isn't it all natural?) can contain *Clostridium botulinum* spores. Mature children and adults are unaffected by these spores because of a well-established lawn of microflora in the intestine. Infants, on the other hand, have a "sterile gut," which means there is not a well developed lawn of competing organisms. This allows infants to contract infantile botulism, which is often fatal, from ingesting the spores of this

nasty organism. The message is that infants should not be given unpasteurized honey. This includes a little dab on the pacifier. Some health-food stores post this warning on unpasteurized honey, but the warning is not always read by shoppers.

So there is my answer and annual public service announcement. I hope your next batch of mead tastes like mead and not like Nyquil.

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Mr. Wizard

I'm confused about making a yeast starter. I've been using Wyeast and making a starter according to the instructions on the package, which say to use 1/3 cup dry malt extract in one pint of water to give a specific gravity around 1.020.

On the other hand, I've read several articles that say you should use a starter

with an SG about the same as the wort in which you will pitch the starter.

So far I've used the Wyeast recommendations and my fermentations usually start within eight to 12 hours. Will I get quicker starts if I use a more concentrated starter? Which way will give me the greatest pitching rate?

Steve Jones
Johnson City, Tenn.

To answer the primary question regarding yeast growth: Higher-gravity worts, within reason, will produce more yeast mass than lower-gravity worts because there is more carbon in the wort to convert into yeast cells. I like to use a starter with a gravity around 1.048 because this is similar to the gravity of most worts and the gravity is low enough to give the yeast enough oxygen for good growth. If the wort gravity is much higher than 1.048, then lack of oxygen becomes a limiting factor and it is necessary to add air during growth. This is easy in a laboratory but is usually a risky endeavor at home since it can introduce bacteria or wild yeast if done improperly.

If you really want to grow yeast, the best way is through aggressive aeration. Commercial breweries with yeast propagation plants use intermittent sterile-filtered air to give the yeast the oxygen it needs for fatty acid and sterol synthesis. These compounds are necessary for cellular membrane production. The other key ingredients are a carbon and nitrogen source and assorted essential nutrients. These are supplied through wort, and there is more in higher-gravity worts. Commercial propagation plants are currently able to produce yeast slurries with 150 to 200 million yeast cells per milliliter; that's about four times the concentration produced by homebrew methods.

Although I don't think it is a good idea to aerate during propagation at home because of the risk of contamination, I do think that a gravity of 1.048 is better than 1.020. But 1.020 will work. Whatever you choose, the most important factor is a rapid start, a healthy fermentation, and good-tasting beer.

Mr. Wizard's Address

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

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

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Brewery: Palmetto Brewing Co.,
Charleston, S.C.

Years of experience: Four

Education: B.S. in chemistry,
Gettysburg College, Gettysburg, Pa.;
M.S. in chemical engineering, University
of Maryland, College Park, Md.

House Beers: Palmetto Amber, Pale
Ale, Porter

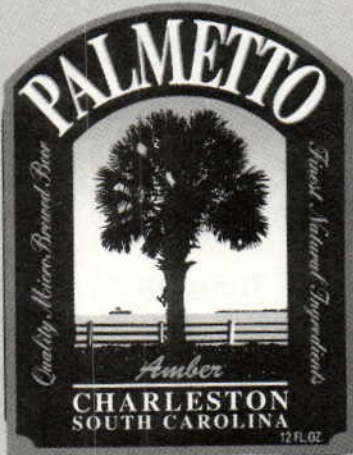
The way we cool wort is consistent with our efforts to recycle everything. Most breweries, ours included, transfer a good percentage of the heat in the kettle to the water in the hot liquor tank. This is accomplished with a one- or two-stage plate heat exchanger, cooling the wort while heating supply water.

Energy recovery is not as much of an issue for the homebrewer, but the other concerns related to cooling — aerating and transferring the wort to the fermenter — are shared by all brewers.

A typical commercial wort-cooling operation and a homebrewing setup have similarities as well as differences. A commercial brewer pumps wort through a two-stage heat exchanger. The cool wort is then aerated as it passes to the fermenter. The wort temperature is controlled by adjusting the flow of the wort. Opening the wort valve increases the wort flow rate, decreasing its time through the heat exchanger. In turn this lowers the ability for the exchanger to cool the wort. That control can be manual or automatic.

Homebrewers typically cool wort with a submerged coil in an ice or water batch. Small wort chillers are

Palmetto Brewing Co.



Brewer: Ed Falkenstein

Ed Falkenstein

"Consistency and speed are crucial to cooling your wort."

available but are very similar to the more basic setup. Just like a commercial operation the temperature is controlled by monitoring the wort flow rate. In my opinion the simplest way is to let the wort flow down the inside

wall of the fermenter.

Whatever method you use, quality always plays a role. That includes temperature consistency, a short strikeout, limiting trub to the kettle, and proper sanitation.

The Tips

- Sanitize everything that contacts the wort after it touches the kettle.
- Keep the wort free of trub to avoid clogging, which reduces the flow in the heat exchanger.
- Keep strikeout time short to reduce the possibility of exposure to bacteria.
- Keep strikeout temperature consistent to avoid a lag in yeast propagation.

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Tips from the Pros

Striking out at consistent wort temperature is important for two reasons. 1) Yeast only metabolize dissolved oxygen, and the solubility of oxygen is a function of the atmospheric pressure and wort temperature. 2) Trying to reduce strikeout time and bringing the wort a few degrees above fermentation temperature while cooling it in the fermenter can cause yeast to lag in the propagation stage. Therefore you need to keep cooling off the jacket when the yeast is first starting. Transfer it at fermentation temperature or a degree below to see positive results.

What this means for the homebrewer is if you are not measuring your wort temperature as it enters the fermenter, start. Then control the temperature by controlling the wort flow. You can control your wort flow by pinching and restricting the transfer tube or by adding a valve. If your wort temperatures are running too low even at full flow, then that indicates your wort is spending too much time in the chiller. You have two options. Reduce the number of coils or increase the flow by raising the hot-wort container higher.

Minimizing the strikeout time is crucial to slowing the rate of alpha-acid isomerization. This bittering action does not shut off when you stop the boil; it only slows down. Keep the strikeout short by keeping your heat exchanger, namely the coils, clean.

Minimize the hot-break carryover by keeping the trub in the kettle. Otherwise it could hinder your transfer to the fermenter by clogging the heat exchanger and stopping the flow. We pump the wort off the side of the kettle. For the homebrewer, keep the suction of the siphon tube above the trub.

Sanitize everything that contacts the wort after it touches the kettle. Nothing will ruin your brew more than an infection. We sterilize the wort transfer lines and heat exchanger by circulating 160° F water for 30 to 40 minutes. Homebrewers you can sterilize their metal cooling coil in the oven for 10 minutes at a low heat setting (225° F). You can use hot water to sterilize any plastic tubing by slowly pushing hot water (130° to 140° F) through the tubing for 30 to 40 minutes. ■

Tracing the History of Munich Dark Lager

by Alex Fodor

At one time probably all the beers of Munich were dark lagers. Prior to modern malting technology, maltsters kilned their malt by allowing the hot fumes from burning wood or coal to pass directly through the bed of grain. The maltster had little control over the degree of roasting the malt received.

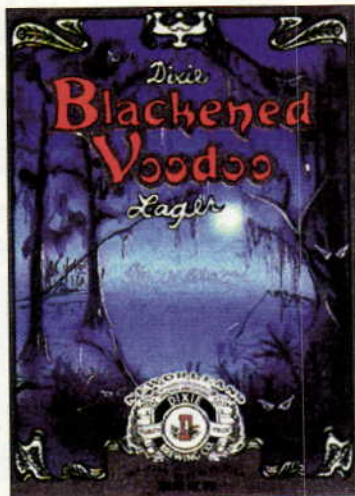
Consequently the malt produced was dark and flavored with the fuel used in the kiln. Inferior breeds of barley with high protein contents also contributed to the darkening of the malt. Of course dark malt begets dark beer. Dark lager remained the staple of Bavaria until the early 1900s, when advancements in malting technology made pale malt widely available.

Today, Munich dark lager, or Münchner Dunkel as the Germans say, still holds a special place in the

Bavarian's stein. Beyond pale malt, specialty grains used in this reddish-amber brew may include Munich, crystal, and a touch of roasted malts. Many German breweries export dunkel to the United States. Versions are available from Hacker-Pschorr, Ayinger, and Spaten. In general these beers have a malty-sweet nose with a touch of bready roastiness. The body is medium-sweet and lingers on the palate. An obviously low hopping rate is evident in the subdued bitterness and absence of aroma.

Because most imported beers will be tainted by oxidation, the pursuit of local interpretations is worthwhile. Look to microbreweries that specialize in German lagers for a taste of fresh dunkel. Freshly brewed dunkels can be hard to find. Another famous dark beer, Oktoberfest Märzen, tends to supplant efforts to popularize dunkel by out-selling it. Still some examples of the style persist. Dixie Blackened Voodoo Lager fairly represents the Munich dark lager style as do dunkels from Gordon Biersch, Thomas Kemper, and California's Sudwerk Brauerei.

Recipes for Munich dark lager have some variations, but most will produce an amber-colored lager that is big in malt, low in bitterness, and slightly roasted. For most versions malt types and percentages by weight fall into the following ranges: 35 percent to 62 percent pale malt, 21 percent to 38 percent Munich malt, 6 percent to 15 percent crystal malt (17° to 80° Lovibond), 0 to 5 percent roasted malt (usually chocolate). A small amount of wheat, 1 percent to 3 percent, in place of pale malt will help beer head retention without significantly impacting flavor. The bitterness falls in the range of 15 to 28



IBUs. Hop aroma should be subtle or nonexistent. Noble hop varieties such as Tettnanger, Hallertauer, and Saaz are appropriate. The brew starts with a gravity between 1.052 and 1.056 and ends with a gravity between 1.014 and 1.018 and an alcohol range of 4.5 percent to 5 percent by volume. At 17 to 23 SRM (standard reference method), the color is amber to deep red.

As with any dark German brew, a decoction mash is preferred. The reactions that occur when the mash is boiled contribute to the deep color and malty character of the beer. However, temperature program and infusion mashing methods can still make fine dunkels. An extended rest at a higher conversion temperature, 155° F, will favor the enzymatic formation of dextrans. This will tend to sweeten the beer and increase body.

Fruitiness and diacetyl do not belong in a Munich dark lager. Managing the fermentation and aging carefully will help avoid such flavors. German lager yeast of the Munich and

Bavarian types are a good choice. The beer should be at a temperature between 50° and 60° F when the yeast is pitched. The temperature is lowered to 46° to 50° F as the fermentation starts. After fermentation allow the temperature to rise to 55° F for a couple days for a diacetyl rest.

Following fermentation the beer should be aged cold for at least a month before it is consumed. This period of cold storage, called lagering, will allow the beer to mature and helps drop out yeast.

Off-flavors such as sulfur, acetaldehyde, and diacetyl will decrease as the beer ages. After lagering is complete, sit back and down a much-deserved liter of dunkel.

Slam Dunkel (5 gallons, all-grain)

This all-malt version of traditional Munich dunkel derives its color and flavor from five malts. Rich and malty yet entirely drinkable, this brew will keep the crowd cheering for more.

Ingredients:

- 4.5 lbs. pale two-row malt
- 3 lbs. Munich malt
- 1 lb. crystal malt, 60° Lovibond
- 0.5 lb. crystal malt, 20° Lovibond
- 0.25 lb. chocolate malt
- 2 oz. Tettnanger hops (4% alpha acid), 1.2 oz. at 60 min., 0.8 oz. at 30 min.
- Munich or Bavarian lager yeast

Step by Step:

For a temperature program mash, dough room-temperature grains into 3 gals. of 140° F mash water to reach a temperature of 132° F. Hold for 15 minutes. Then raise temperature two degrees per minute to 155° F and hold for 45 minutes. Raise temperature to 165° F. Sparge with 168° F water to collect six gallons of wort.

Boil for 30 minutes, then make the first hop addition. After another 30 minutes of boil, add the next measure of hops. Boil for another 30 minutes to make a total 90-minute boil. Cool and aerate wort, rack into a carboy, and

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add yeast at 60° F. Hold until start of fermentation, then slowly chill to 50° F. Hold for the remainder of fermentation.

After fermentation allow temperature to rise to 55° F for two days. Then cool to coldest refrigerator temperature and lager for four weeks. Package as desired and enjoy.

OG = 1.052

FG = 1.014 to 1.018

Slam Dunkel (5 gallons, partial mash)

Ingredients:

- 3 lbs. pale malt extract
- 1.5 lbs. pale two-row malt
- 3 lbs. Munich malt
- 1 lb. crystal malt, 60° Lovibond
- 0.5 lb. crystal malt, 20° Lovibond
- 0.25 lb. chocolate malt
- 2 oz. Tettnanger hops (4% alpha acid), 1.2 oz. at 60 min., 0.8 oz. at 30 min.
- Munich or Bavarian lager yeast

Step by Step:

For a temperature program mash, dough room-temperature grains into 2 gals. of 140° F mash water to reach 132° F. Hold for 15 minutes, then raise two degrees per minute to 155° F and hold for 45 minutes. Raise temperature to 165° F. Sparge with 168° F water to collect 4 gals. of wort. Add 1.5 gals. of water, 4 gals. hot wort, and malt extract into kettle. Heat to boil while mixing in extract.

From the start of boil, follow the remainder of the step by step from the all-grain version of Slam Dunkel.

OG = 1.052

FG = 1.014 1.018

My First Dunkel (5 gallons, extract with specialty grains)

My First Dunkel is an all-extract brew that takes advantage of the many dark malt extracts available. This recipe is easy to brew and just as easy going down.

Ingredients:

- 7.5 lbs. dark malt extract
- 1 lb. crystal malt, 20° Lovibond
- 2 oz. Tettnanger hops (4% alpha), 1.2 oz. at 60 min., 0.8 oz. at 30 min.
- Munich or Bavarian lager yeast

Step by Step:

Pour crushed grains into nylon mesh bag. Steep in 2 gals. water at 150° F for 15 minutes. Meanwhile, heat 2 gals. of water separately to 150° F. Remove grain bag and place in colander or strainer. Place colander over kettle. Pour hot water through grains in colander. When finished, the kettle should contain 4 gals. of grain-tinted water. Stir in malt extract while heating kettle to boil. As soon as boil starts, add hops. Add remaining hops 30 minutes later. Total boil is one hour.

From the end of boil, follow the remainder of the step by step from the all-grain version of Slam Dunkel.

OG = 1.052

FG = 1.010 to 1.015 ■

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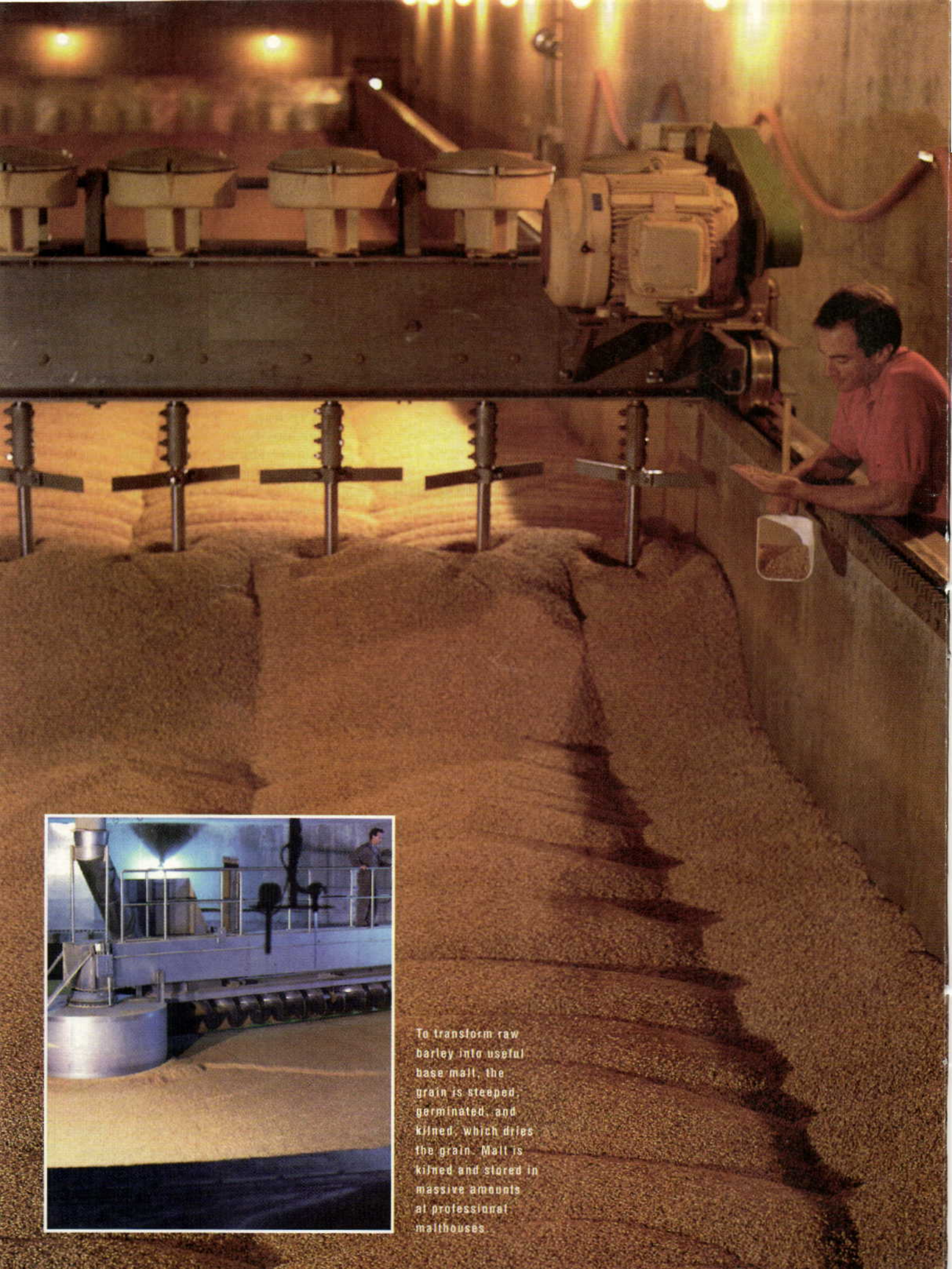
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MALT MADNESS

Explore the Variety of Specialty Grains

This is the first article of a comprehensive three-part series on brewing with specialty grains.

by Jeff Frane

Ten years ago a top notch retailer's selection of supplies probably included a couple dozen British extracts and kits, a couple of German ones, and one or two American brands; eight to 10 hop varieties; three or four dry yeasts; and five or six specialty malts.

These days things have become more interesting. The array of malt extracts in many stores includes selections from Australia and Belgium, the hop list could require a chart four feet high, there may be 25 yeast strains from which to choose, and malts sometimes require their own room with floor bins for the base malts and specialty grains two shelves high. An embarrassment of riches. Many of the specialty grains are from Belgium, Britain, and Germany. Some didn't even exist a decade ago.

Many a brewer's first beers were very simple concoctions built of extract syrup and some added hops, but many brewers are now taught to make better beer right from day one. Better beers require adding some specialty grains to round out and enrich the malt extract. Even for beginning brewers grains can be used alone or in concert with extract to mold a beer's flavor and color profile and enhance its overall character. But it's still a bad idea to send beginners into the malt room without a native guide.

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Malt Types					
Malt types	Examples	Qualities	Beer styles	Amount in 5 gallons	Lovibond (degrees)
Base	ale, lager, pilsner, and Munich malts	body, flavor	all	7 to 20 pounds	Munich: 5°-35°
Caramel	dextrin, carastan cara-pils, cara-Vienne, cara-Munich, Special B, and crystal malts, cara-wheat	sweetness, mouthfeel, color, foam stability	very pale beers, wheat beers, German lagers	1 to 10 pounds	Lightest: 1.5°-17°; can be as dark as 135°-165°, up to 250° for Special B
Roasted	biscuit, British amber, brown, chocolate, black, carafa, and Kilncoffee malts	can define beer style; deepen the beer color; from toasted to burnt flavor	brown ales, porters, dark beers	2 to 8 ounces	23°-26° biscuit 50°-70° amber/brown 325°-500° chocolate 500°-600° black
Other:	roasted barley: honey malt: rauchmalt:	burnt flavor sweet notes smokey flavors	stouts pale beers smoked beers	2 to 8 ounces 1 to 20 pounds varies	varies 25° to 30° varies

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In the Beginning

There are two broad categories of specialty malts: caramel malts and roasted malts. All the malts start out the same as "base malts," which are the foundation and framing of beer. (In this analogy specialty malts are like the paint, the carpeting, and the cabinetry — they make the beer house more interesting and distinctive.)

All malt starts as raw grain, usually raw barley (exceptions will be noted below). Barley not only gives beer its special flavor, but the grain itself seems to have been designed to make the maltster's and brewer's jobs easier. It has all the necessary proteins, carbohydrates, and enzymes, as well as a physical structure tailor made for brewing — it even comes with its own built-in filter bed.

The grain is soaked ("steeped") in tepid water for several days. This lightly washes the grain and allows the moisture content of the barley to rise enough for germination to begin.

Germination can take place in a

number of ways. The traditional method (now very rare) was called "floor malting," with the "green" malt spread on a specially constructed floor that allowed water to drain off. The grain was turned with hand tools to keep temperatures even and the malt well aerated. More modern methods include rotating drums

or pneumatic systems, primarily the latter.

One pneumatic system, known as the Saladin Box System, is used by more than 90 percent of North American maltsters. In this system the green malt is spread out in a large compartment with a false floor. Screws regularly turn the grain and fans blow

Green malt is loaded into the kiln, where it is spread over the slotted floor and dried.



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air up through the grain, maintaining consistent temperature, aerating the grain, and driving off CO₂.

During germination the barley

embryo begins development in the seed. Enzymes are formed, and the process is begun that will eventually provide the simple sugars necessary for fermentation. Much of the protein breakdown takes place during this period; the diastatic enzymes now being formed will only be allowed to go into action when optimum temperatures are reached in the mash tun.

Base Malts

At this stage base malts (ale malt, lager malt, pilsner malt, and so on) are "kilned." Hot air is blown over the malt to arrest germination (by effectively killing the embryo plant) and to produce "melanoidins," the colored aromatic compounds that give the malts their

Steeping is the first step of the malting process. The barley is immersed in fresh water for several days. This washes the grain and raises the moisture content of the barley enough to start germination.

distinctive flavor and color. Depending on the nature of the beers that will be brewed from it, the malt is kilned at lower or higher temperatures. During kilning, the moisture content of the grain drops from about 45 percent to less than 5 percent, allowing the malt to be stored for long periods.

Caramel Malts

Caramel malts never get to the kiln. They are taken as green, germinating malt and placed in roasting cylinders. The heat and moisture are held at levels sufficient to effectively "mash" the interior of the malt. Starches are converted to sugars and the endosperm (the grain's nutrient portion) is liquefied. The temperature is raised to 150° C or so, so that the sugars are caramelized (browned and hardened).

Control of time and temperature allows for a tremendous array of caramel malts. As the color increases, so does the intensity of flavor and sweetness. The darkest of the caramel malts have a definite caramel or raisin



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flavor, indeed. Due to the high temperatures of production, caramel malts contribute no enzymes to the mash. Because the starch conversion has already occurred, however, they can be used to good effect in extract-based beers in which there is no true mashing.

Caramel malts add to the beer's sweetness, its mouthfeel (the perception of the beer's body when it's in your mouth), and its color (varying by type of malt and quantity used) and enhance foam stability (how long the head lasts after the beer is poured into a glass).

The palest caramel malts are known as dextrin or cara-pils malts. They are 1.5° to 3° Lovibond. The Lovibond scale is a commonly used system for rating the color of malt or beer. Other scales include SRM (Standard Research Method) and ASBC (American Society of Brewing Chemists). The three systems use similar methods with similar results. Knowing a malt's Lovibond rating is crucial for accurately developing consistent recipes and targeting specific beer styles.

Low-Lovibond caramel malts are not subjected to the high temperatures that create notable darkening and sweetness. Dextrin malts are used in very pale beers to enhance mouthfeel and maltiness without adding color. Carastan malts are a British equivalent, but somewhat darker (13° to 17° Lovibond or 30° to 39° Lovibond) and slightly sweeter.

American, British, Belgian, and German malthouses all produce caramel malts in various ranges and characteristics. The "national" characteristics are not clearly definable but with practice can be discerned. Defining the differences will be the subject of a subsequent article in the series. In general it is safe to suggest that beer styles be matched with their national component (for instance British caramel malt in pale ales, German caramel in bocks).

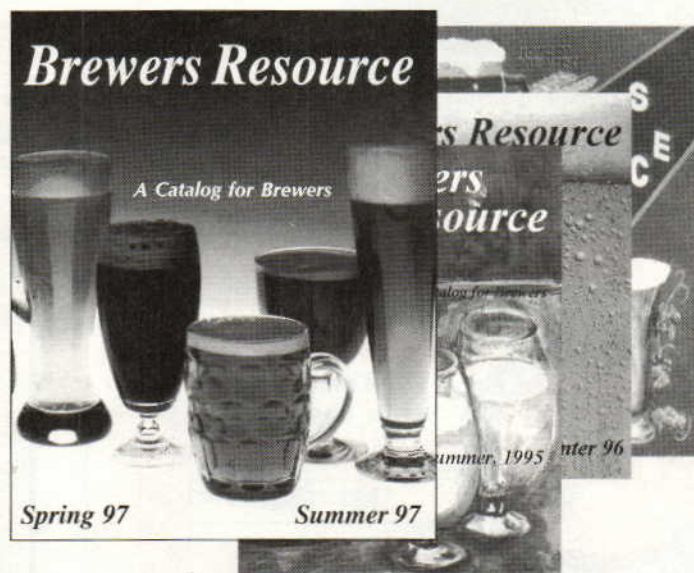
The quality of caramel malts is determined by the quality of the raw barley and by the maltster's skill. European caramel malts are made from the finest two-row barleys, and the Belgians seem to have the upper hand on both raw material and skill. DeWolf-Cosyns in particular produces true gems in its cara-pils (4° to 8° Lovibond), cara-Vienne (19° to 23° Lovibond) and

cara-Munich (53° to 60° Lovibond) malts. Unique among caramel malts is Belgium's Special B (75° to 250° Lovibond), an intensely rich and dark malt with a powerful, raisin-like character that adds a distinctive quality to doppelbocks and Scottish ales. Be cautious! Experiments should begin with only a few ounces in a five-gallon batch. The flavor can easily overwhelm a beer if too much is used.

American malt houses, such as Briess and Schreier, make an array of caramel malts (10° to 120° Lovibond) and the quality seems to have increased tremendously in recent years, perhaps in response to the importation of fine European malts.

British (English and Scottish) maltsters make exceptionally good caramel malts. Crystal malts range from 50° to 115° Lovibond and dark caramel from

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135° to 165° Lovibond.

Special note should be made of cara-wheat (15° to 30° Lovibond), a new product from Malteries Franco-Belges. Wheat, rather than barley, is malted and caramelized, contributing



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its own distinctive flavor and structure.

Roasted Malts

Roasted malts are produced from regularly kilned pale malt. As the malts turn in the roasting drum, control of time and temperature produces a wide range of color and flavor.

Roasted malts have had all the enzymes and sugar made inactive (due to high heat) and are used in very small quantities to produce a specific flavor profile and deepen or darken the color of the beer. In some cases a beer style is virtually defined by the expert use of roasted malts.

The Belgians produce a very light roasted malt known as biscuit malt (23° to 26° Lovibond), which has been

roasted near 160° C (320° F). When it first appeared on the American market, homebrewers seemed baffled about its use. It gets its name from the toasted flavor it adds, and has found its way into various brown ales where its nuttiness is particularly welcome. A similar malt can be produced at home by spreading pale malt on a cookie sheet and baking it at 300° F for about one hour. British amber or brown malt (50° to 70° Lovibond) has a similar biscuit-like flavor.

Chocolate malt (325° to 500° Lovibond) gets its name from the color — very like dark chocolate — not any resemblance to milkshakes. It has a very roasted flavor, like a rich coffee. Chocolate malt is particularly useful for dark ales and even stouts, less likely than its darker cousins to overburden a beer.

The darkest of all the roasted malts is black malt, sometimes known as black patent malt. At one time, apparently, the process for making this malt was patented by its originator,

After steeping, the green malt is drained and is carefully monitored while it is allowed to germinate.

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Ayinger Maibock

World Champion—Platinum Medal
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CIRCLE 48 ON READER SERVICE CARD

hence the name. Some form of black malt is produced in the United States, Belgium, Britain, and Germany. These malts are roasted at rising temperatures, 160° (320° F) to 175° C (347° F), then 215° C (389° F), and finally at 220° to 225° C (398° to 407° F), where the malt is sprinkled with water just before it can burst into flame. Black malt is one step shy of carbon and tastes like it. French or Italian roast carried to the edge.

Very little black malt (500° to 600° Lovibond) is necessary to drastically darken beer, and too much can easily ruin even the darkest stout. Variations of these malts are produced by several malt houses. In Germany the malt is known as carafa and is available in various colors. Malteries Franco-Belges makes a Kilncoffee malt, very similar in color to chocolate malt and with a distinct coffee-like aroma.

Un-Malts and Oddities

In addition to the roasted malts, there are roasted un-malts. Roasted barley is subjected to the same roasting schedule as black malt, but the barley never goes through any of the malting stages. It is somewhat harsher than black malt and is used exclusively in stouts, particularly Irish dry stouts.

Occasionally, other roasted grains (such as wheat and rye) appear, although they are unusual. Additionally, there are grains that are neither caramel malts nor roasted malts but are used for special effect in brewing. Many are produced as if they were standard base malts but with a twist.

The Canadian firm Gambrinus Malting makes something called honey malt, which is its attempt to reproduce an old German malt, Bruhmalz. Honey malt is darker (25° to 30° Lovibond) and somewhat sweeter than pale malt but without any bitterness developed through time in the roaster.

Some malts are smoked. German rauchmalt is smoked over wood. British malts intended for whiskey are smoked over peat fires. The rauchmalt is actually a base malt. It can be used for 100 percent of the grist or can be added in smaller portions for a subtler smokiness. The peat-smoked malts are definitely not intended to be used like this and should only provide a very

small fraction (less than 5 percent) of the most intense beers. Over-doing it can produce a beer with a fine *eau de lighter fluid* character that few people find agreeable.

Munich malts (5° to 35° Lovibond) are actually base malts. Some may be floor malted, but all are kilned at slightly higher temperatures than pale malts, giving the malt a richer color, aroma, and lots of malty goodness.

They can be used as base malts or as a specialty addition.

The creative and effective use of specialty malts is one of the first skills necessary to replicate beer styles or put a distinctive stamp on homebrewed beer. Whether working entirely from grains or with an extract base, specialty malts allow the brewer to determine the color, body, sweetness, head retention, and clarity of the finished beer.

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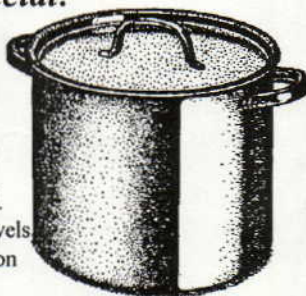
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It Might Just Be a Dream Job

by Sal Emma



It's 8 a.m. and Steve Dresler, The Man With the Perfect Job, is tasting the latest batch of Sierra Nevada Pale Ale. It's the first thing he's consumed since his clock-radio clicked on nearly two hours ago, signaling the beginning of a new work day.

"I don't eat breakfast to ensure that my taste buds are not confused by food," he says. "This morning, for example, we bottled five different batches and I tasted them all. It's extremely important for us to keep sensory tabs on the product."

Dresler doesn't argue when someone — almost always a homebrewer — tells him he has a great job. After all, he parlayed a passion for homebrewing and bachelor's degrees in biology and chemistry into a position as brewmaster of Sierra Nevada Brewing Co., one of the country's most acclaimed breweries. Dresler, who has been the brewmaster

at the Chico, Calif., company since 1985, is the man who develops recipes, oversees the brewing process, and

demands that each bottle or keg leaving the brewery must be of top quality.

A typical day for Dresler includes developing recipes; purchasing hops, grain, and other raw materials; checking on the brewery taproom, clean-in-place, cellaring, brewhouse, and packaging operations; and, of course, sensory evaluation. All day long a parade of people from throughout the brewery come to see him and consult over this and that. He doesn't stay in his office for long. Dresler's a true

Even the control panel for Sierra Nevada's brewhouse is copper. By pressing a few buttons, brewers can load the grist box and pump the mash.



SAL EMMA



TY BARBOUR

*Stainless steel
"Yorkshire Squares"
are used in Sierra
Nevada's open-
fermentation room.*

believer in "MWA," management by wandering around, keeping himself involved and accessible to the team of brewers and scientists he oversees.

Okay, maybe Dresler's job isn't perfect. He does, after all, have to deal with administrative tasks such as

making sure there's enough beer in the warehouse each day to meet shipping orders and creating a rationing plan for distributors if there's not. But he doesn't mind.

"I'm more in love with brewing now than I was when I was doing it to supply

my own beer habit," he says. "It's worth a lot of money to get up in the morning and look forward to going to work."

A Hoppy Workplace

A short time later Dresler pulls on the door to the Sierra Nevada hops store. It rattles open and an intense, intoxicating aroma bursts out. He walks inside and immediately his breath condenses from the chill. The temperature is just above freezing. Bales of hops fill the room.

Sierra Nevada's signature has long been the brewery's aggressive use of hops. Whole hop flowers are used exclusively, no pellets, and though all of the hops are stored here they are evident throughout the brewery; they stick to the brewers' boots and get tracked all over the building. It's one of the most charming aspects of Sierra Nevada and

The Recipe ("Well, a Recipe") (5 gallons, all-grain)

Dresler used to be more open about Sierra recipes. That was before Anheuser-Busch started selling a Sierra Nevada Pale Ale clone on the West Coast known as "Pacific Ridge." Few industry insiders believe A-B snatched the SNPA recipe from Dresler's brewhouse wall, though a handful of people on brewery tours have photographed it over the years.

Considering A-B's incredible laboratory resources, it's more likely that they simply ran an analysis on the pale ale and reverse-engineered it. Dresler was cagey about handing us the recipe but instead described it in broad terms. The secret to SNPA's incredible hoppy character is the addition of "way too much" Cascade at the very end of the boil, dunked in quickly to limit exposure time and prevent grassy flavors.

Armed with Dresler's description, the *BYO* research team hit the calculator and came up with a pretty darn good homebrew rendition of Sierra Nevada Pale Ale.

Ingredients

- 7.6 lbs. pale two-row malt

- 0.4 lb. Briess caramel malt, 40° Lovibond
- 0.4 lb. Briess cara-pils malt
- 15.5 g. (0.55 oz.) Nugget hops (13% alpha acid), for 60 min.
- 11.25 g. (0.45 oz.) Perle hops (8% alpha acid), for 30 min.
- 100.25 g. (4.01 oz.) Cascade hops (5.5% alpha acid), 16.25 g. (0.65 oz) for 30 min., 84 g. (3.36 oz.) after boil for 5 min.
- 1 tbsp. Irish moss flakes, for 10 min.
- Yeast from SNPA bottle or Wyeast's "Chico"
- 3/4 cup corn sugar for priming if bottling, 1/3 cup if kegging

Step by Step

Mash in crushed malt in 3 gals. water at 164° F. Your target mash temperature is 154° F. Hold at this temperature for 90 minutes and sparge with 4 gals. water at 170° F. Collect six gals. wort. Boil for 30 minutes. Add Nugget hops and boil 30 minutes more. Add Perle and the first Cascade addition and boil 20 minutes more. Add Irish Moss and boil 10 minutes more. Turn off the

heat and toss in the second Cascade addition. Leave the hops in no longer than five minutes, then get them out. We found it easiest to use hop straining bags for each hop addition. This makes it especially easy to remove the last hops. Chill and take a gravity reading. Target gravity is 1.035 to 1.040. Add water if necessary to adjust gravity. Pitch a strong starter cultured from a bottle of SNPA or a starter of Wyeast "Chico" yeast.

When fermentation is complete, bottle with 3/4 cup corn sugar, boiled in a cup of water or the unconditioned beer. For authentic flavor, if you keg your beer, you should let this one condition naturally in the keg after adding 1/3 cup priming sugar.

Extract Version

Substitute 6.5 lbs. liquid pale extract for the two-row. Tie the caramel and carapils in a straining bag. Steep in 160° F water for 20 minutes. Discard grains, bring liquid to boil, add extract, and continue with the same hopping, pitching, and priming schedule as with the all-grain version.

a constant reminder that the beers are made in the traditional way.

Dresler is proud of his hops. He spends a lot of time choosing them, buying them, and thinking about them. "Look at that bale," he says, pointing to a burlap bundle of Saaz imported from the Czech Republic. He's referring to the grower's logo, which is stamped with a red wax seal. "I'm going to cut that out and frame it."

Dresler can talk long and hard about the flavor, aroma, quality, price, and politics of hops. "Much of what's available is dictated by the big brewers. The growers plant what's hot — what they know the big brewers are willing to buy. There was a time when Cascades were going out of style and growers were ripping them out. Prices more than doubled," Dresler says.

To guarantee his brewers will have the hops they need, he buys hop futures. Sierra has committed to buy hops through the year 2000.

Dresler has lots of stories about hops. He once decided to brew a batch of English brown ale. He knew he needed Kent Goldings hops but could not get any through his domestic sources. He had them flown in by air freight from England.

Once he decided to brew with green hops instead of the traditional dry product. The recipe was Harvest Ale, made with a blend of unprocessed Centennial and Cascade from Yakima. The hops were in the kettle less than 48 hours after they were harvested. Since green hops are so much heavier than dry, Dresler used nearly 500 pounds compared with the usual 100 pounds needed for a batch at Sierra.

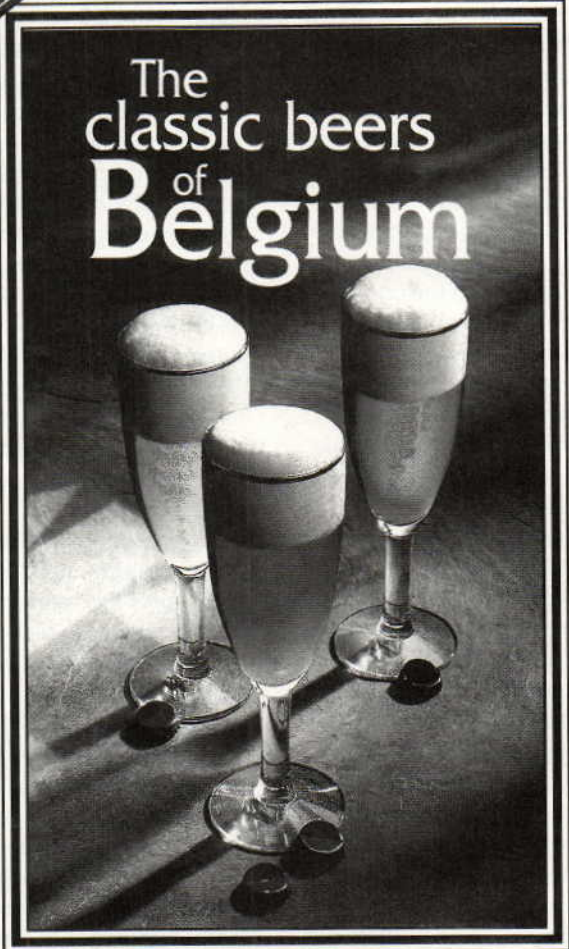
In addition to the classic European hops plus tons and tons of Cascades, the signature hop of the brewery's flagship Sierra Nevada Pale Ale, Dresler also keeps Strissel Spalt, a variety that few other brewers use. "I love Strissel Spalt. It's one of my favorite hops. It's from the Alsace region of France and we use it for our wheat beer. On paper the analysis is very close to Saaz. We started using it when Saaz became scarce. But I've stuck with it because I really like it. It has a character very different from Saaz and really well suited to our wheat (beer)," he says.

Yeah, We're Jealous

Next stop is the mill room. Actually there are two mills, but the old mill is not used anymore. It's kept around for emergencies — and for sentimental reasons. It's an old Peerless, painted white with fancy polished metal identification plates riveted to the case. The new mill is much more austere and unembellished. But what a mill it is. "This is our new Huppmann hydrating

mill. As most homebrewers know, milling the malt and doughing into the mash water are usually two separate processes. This mill does both," Dresler says.

The hot mash water is sprayed into the mill as the malt is crushed. What comes out is not just grist but temperature-controlled mash. Conversion starts immediately as the mash is piped to the mash tun in the brew-



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The advertisement features a black and white photograph of three different styles of beer in various glassware: a tall, slender flute glass, a shorter, wider tulip-shaped glass, and a classic chalice glass. Each glass is filled with beer and topped with a thick head of foam. The glasses are set on a dark surface, and the lighting creates soft shadows. Above the glasses, the text 'The classic beers of Belgium' is written in a serif font, with 'of' in a smaller size and 'Belgium' in a large, bold font. A black ribbon with the word 'NEW' in white, slanted letters is positioned in the upper left corner of the advertisement frame.

Nowhere else in the world is there a greater diversity of beer styles than in Belgium. From crisp, tart Saisons, to strong, spicy Trappist Ales brewed by monks, from sweet and sour Brown Ales, all the way to wild fermented Lambics made with raspberries or cherries. The Belgian author, journalist Christian Deglas describes in mouthwatering detail every beer being brewed today in Belgium. This book covers historical background, brewing techniques, and also gives thorough tasting notes and includes over 200 full-color photographs.

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CIRCLE 32 ON READER SERVICE CARD



TY BARBOUR

From the walkover Brewmaster Steve Dresler gets a bird's-eye view of Sierra's noisy bottling line, which tackles hundreds of bottles a minute.

house. Sticker price: \$250,000.

Brewing at Sierra Nevada

The brewhouse resides in a white tiled room with large windows. The surprising thing about this 100-barrel, two-vessel system is that it's all copper. Not copper-clad stainless, copper. "It was built in the 1960s. We bought it used from Germany," recalls Dresler. It's a challenge to clean, since the chemicals commonly used in breweries would eat the copper. Instead, a very light caustic solution is run through the system, then the brewers climb inside and scrub everything down on regular intervals. Old-fashioned elbow grease does the heavy cleaning in the brewhouse.

This 100-barrel brewhouse produces an incredible volume of Sierra Nevada beer. When the brewery first opened in 1980, the owners hoped to reach an annual production of 50,000 barrels. This goal was achieved in the second year of operation. Last year Dresler's team pumped out 285,000 barrels with boilers fired up around the clock. A quarter-million barrels were sold. "This year we hope to make 325,000 barrels and sell at least 285,000," Dresler says.

Sierra's brewers used to make six batches per day, before the addition of a 100-barrel stainless wort receiver. Now the mash tun does not have to wait for an empty boiler, since the wort is held in the new receiver. Production has increased to nearly nine batches per day. The Sierra engineers have also increased the efficiency of the brewhouse by fabricating automation features retrofitted to the old Huppman brewhouse.

A new 200-barrel brewhouse

scheduled to go on line this fall will be stainless jacketed in copper to maintain the traditional look.

To brew a batch at Sierra, the brewer first consults the recipe sheet and taps a few automation buttons to load the grist box. Then the grain is fed into the mill and the resulting mash is pumped to the mash tun. The brewers mash, lauter, and sparge in the traditional way and wort is sent either to the receiver or the boiler, depending on which is available.

Steam is pumped into the boiler jackets and the wort is heated. While the brewer waits for the boil to begin, he goes to the brewhouse hop store to get his hops.

The small brewhouse hop store holds enough hops for a few days of brewing. The entire place is covered in yellow-green lupulin hop residue. The brewer's shovel has what used to be a white plastic handle. Now it's green. The hops are stored by variety in large bins. Brewers shovel hops for each addition into the trash cans, weigh them according to the recipe, and bring them out to the kettle.

Back in the brewhouse, the hops are dumped in by hand, the old-fashioned way, according to the recipe schedule. When the boil is complete, the brew is piped to the cooler and assigned to a fermenter for pitching and fermentation. The gear is cleaned and the process starts over again, around the clock.

When fermentation is complete, the beer is filtered and sent to the priming tank where it's primed with added sugar, just like homebrew.

It's bottled the next day and sent to the warehouse for aging and bottle

conditioning, a 14-day process. "Yeast is a natural preservative, an antioxidant, and a biological stabilizer. We bottle condition because it gives us an edge on freshness in the marketplace," Dresler explains.

Behind the Taproom Wall

Except for those who take the brewery tour, it's doubtful that the people sipping beer in Sierra's taproom have any idea what a busy production facility is hidden behind the taproom wall. The bottling room is enormous and noisy as hundreds of bottles clink their way through the line each minute.

Fermenters are tucked away in nearly every corner of the facility. Most are modern cylindro-conicals, but Dresler's favorites are the old stainless "Yorkshire Squares" still in use in Sierra's one open-fermentation room. Here the heady, yeasty aroma of fermenting ale permeates the air above the fermenters, which are too big to look into without standing on a ladder. The room is heavily insulated and refrigerated to keep it at fermentation temperature. This makes it eerily quiet, shielded from the din of the

Steve Dresler's Homebrewing Tips

Steve Dresler has not forgotten his roots as an enthusiastic homebrewer. Applying all he's learned as brewmaster at Sierra Nevada, he offers the following tips for making your beer better:

1. Use the best equipment you can afford. Stainless is best.
2. Critique your yeast. Without good yeast, you can't make good beer. He's flattered that so many homebrewers use his yeast from bottles of Sierra Nevada Pale Ale and he thinks it's a great idea, because he knows his yeast is one of the best around!
3. Get aggressive with formulation and experimentation. Mix it up. Use ale hops in lager and lager hops in ale. If you like it, then it's good beer. Trust your palate and be creative. There are too many possibilities to limit yourself to strict styles.
4. Don't take yourself too seriously. If homebrewing weren't fun, it wouldn't be worth the mess.
5. Consider going all-grain.
6. Use the freshest hops you can get. Whole leaf is best.

brewhouse and bottling line.

And on the back end of the brewery, handsome Sierra Nevada tractor-trailer rigs pick up finished product for delivery. "We bought our own fleet of trucks a few years ago when it became apparent that hauling it ourselves was more cost effective," Dresler says. The brewery also has a dock for loading spent grains into dump-trailer trucks, to be hauled away as livestock feed.

Owning a fleet of trucks, and brewing enough beer to fill them, is a big change from Dresler's early days at Sierra Nevada, where he did odd jobs as one of seven employees (including the owners). Today the brewery employs more than 70 people.

Homebrewer to Brewmaster

Dresler started out like many brewers. He liked imported beer but not the imported price. While finishing his degree at a local university he heard about homebrewing, so he gave it a shot. He enjoyed the process and enjoyed the product.

He liked Chico and stuck around after school, picking up work with a local aircraft parts fabricator. "My background in chemistry helped in the anti-corrosion area," Dresler explains. "But the aircraft job was seasonal and I got laid off every year. During one of the layoffs, I was able to work in the local homebrew supply store where I had been buying ingredients for a few years. I worked the counter and answered questions, helping the clientele increase their knowledge, especially in microbiology."

There's more to the story. The homebrew store had been owned by Ken Grossman, who had recently sold the place and started a brewery in town with his partner, Paul Camusi. That brewery was none other than Sierra Nevada.


Before long word made it back to Dresler that the people at the brewery were looking for help. He also learned that they did not have too many people with formal scientific backgrounds.

Dresler's education helped him land a part-time job in 1982, 14 months after the brewery opened. He did a little of everything, getting a fast education on the product and the professional process. He worked in the lab, on the

bottling line, wherever he was needed.

For six months he worked a few days at the airport, then a few days at the brewery, earning \$5 an hour. He was comfortable with the arrangement, but his new managers wanted him to join Sierra Nevada full time. "Looking back, it wasn't that hard of a choice. I was falling in love with the beer business. I was enjoying it not only because of the final product — I

love beer — but also because it's such a creative business," Dresler says.

Dresler is a big part of Sierra's success. He knows good beer and he knows how to keep it flowing. But more important, he knows how to let his crew do their thing and stay creative. He never hesitates to give credit to his staff, and they are as excited to be making Sierra Nevada as he is. And why not? After all, isn't this the perfect job? 



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Make Wine at Home

by Byron Burch

I'm not really much of a gambling man (unless you count owning a small business). If I were a gambler, though, I'd have a sucker bet to offer anyone foolish enough to take the bait.

During this year's grape harvest in September and October, home wine-makers will be frantically racing in and out of my shop, The Beverage People, in Santa Rosa, Calif. They'll be buying yeast, acids, and cleaners and either buying or renting larger items such as crushers, presses, and pumps.

That's not the bet. The bet is that at least once during the season one of

our homebrewing customers will find his interest aroused by all the activity. When he elbows his way to the counter, he'll ask someone on our staff his version of the following question: "How much harder is it to make wine than to make beer?"

I can't think of a year when this question hasn't been asked more than once. Usually it happens several times over, and if I'm the one they ask, they're always shocked by my response. Beer is much harder to make than wine.

It's true. There aren't very many harmful organisms that can thrive in a

If luck — and the timing of the grape harvester — is on your side, nature will have taken care of things and you won't need to add anything to your grapes.



CHRISTIAN E. BUTZKE / UNIVERSITY OF CALIFORNIA, DAVIS



When red wine is fermenting, the skins rise to the top. There are many different ways to punch down this cap — you can use your hands or a two-by-four.



CHRISTIAN E. BUTZKE

12 percent alcohol solution with a pH between 3 and 3.5. On the other hand, beer, with a pH well over 4 and often only 4 or 5 percent (or so) alcohol, is much less stable.

This being so, it's obvious that beer-makers have to be especially rigorous in their sanitation procedures to ensure success. Winemakers routinely get away with shortcuts that would leave serious homebrewers aghast.

All this is not to say winemakers are careless, but there is no homebrewing equivalent to a bunch of people crushing grapes. Boxes and boxes of grapes are poured into the rollers of a stemmer/crusher to break the grape skins and free some of the juice. As the crushed grapes and juice drop down into the bucket below, a series of rotating paddles whisks the large stems (along with most of the extraneous leaves and some of the bees and spiders present) out the end of the stemming device and away from the wine-to-be, which is now called "must." Also, there is no winemaking equivalent to a homebrewer toiling over a boiling pot of wort, balancing the specialty grain mix and timing hop additions.

Testing the Grapes

As soon as the grapes have been crushed (at the supply shop or with a rented or purchased crusher/stem remover), the must is subjected to two simple but very important tests to determine the sugar and acid levels.

Alcohol and low pH (acidity) are the two main components that give wine relative stability. Under ideal conditions nature does it all for you, and nothing needs to be added. Of course home winemakers can add either sugar or acid to make up for deficiencies.

Homebrewers will be familiar with the test for sugar. It's the same hydrometer (saccharometer) test they do with beer. The only difference is

that most homebrewers refer to the specific gravity scale, whereas most winemakers use a different scale of sugar measurement, known as the brix or balling scale. Most hydrometers purchased at home winemaking and brewing-supply shops include both scales.

The test for acid will be new to many brewers. It's a test for total acidity (TA) rather than pH. Without getting too technical, one could say that testing for TA measures a wine's tartness. On the other hand pH gives a more reliable measurement of the actual stability of a wine (or juice). In most cases there will be a relationship between tartness and stability, so the simpler TA test can be used. Theoretically, you can have a discrepancy between pH and TA if an unstable acid (such as vinegar) is contributing a significant amount of tartness, but that's very unlikely if sound winemaking procedures are being followed. There are advantages to knowing both TA and pH, but in most situations TA will suffice.

The TA test is essentially the first procedure you probably saw demonstrated in your high school chemistry lab. It's a simple titration, in which you take a measured sample of an acid solution (the juice or wine), add a few

How to Make (Red) Wine Step by Step

1. Crush and de-stem grapes.
2. Test the must for sugar content. Correct if needed.
3. Test the must for acidity. Correct as needed.
4. Sulfite the must according to the condition of the grapes.
5. Add yeast.
6. Stir the must twice a day until fermentation begins.
7. Punch the skins down into the liquid twice a day during fermentation.
8. Inoculate with malolactic bacteria halfway through fermentation.
9. Press out the wine after the desired color has been reached.
10. At the end of fermentation, rack the wine from the lees, and store in a

topped up container.

11. Repeat step 10 a month later, and at least three or four more times throughout the year.

12. During one of the rackings, fine with a clarifying agent.

13. Shortly before the next grape harvest in September or October, siphon into bottles and cork them.

14. Store in a cool place until ready to serve.

For white wine, press the wine (step 9) after step 4 and discard the skins. The juice stands for a day and is then racked away from the lees. Skip step 7. Bottling (step 13) can take place as early as March.

drops of color indicator, and begin slowly adding measured amounts of an alkaline solution. When the sample is neutralized, a color change takes place. The amount of alkali it took to neutralize the sample tells you how much acid there was to neutralize. A number of relatively inexpensive acid-testing kits are on the market.

A Pinch of Sulfite

If your tests show that more sugar or acid is needed, it is best to add them at this point. Then the must is "sulfited" to retard the wild yeast present on the grape skins. Retarding wild yeast allows you to add the right strain of yeast to get the effects you're looking for in a particular wine.

Sulfite, usually added in the form of Campden tablets, produces the same spoilage-retarding gas you'd get by burning sulfur in your barrels or other wine containers. Sulfur burning is a practice that dates at least to the Romans. Sulfiting the wine directly, rather than burning sulfur in containers, allows you to measure the amount of gas more exactly. The gas is quite volatile, and after delivering a quick "hit" to the must, much of the sulfite gas disperses within a few hours.

Besides its volatility two things make sulfite work particularly well at removing wild yeast. First, true wine yeast strains are relatively sulfur tolerant compared with many other microorganisms. That allows a winemaker to weaken the competition with sulfite, giving his yeast a head start. Second is its function as an antioxidant.

What happens next is determined by whether you're making a red wine or a white.

Color Coordination

In the case of red wine, the crushed grapes can be left in food-grade plastic buckets. Yeast is added, and the wine is allowed to ferment "on the skins" for at least four or five days (until good color is obtained) and perhaps all the way to the end of fermentation, which usually takes one to two weeks.

When fermentation begins the skins will rise to the top, forming a solid layer called a "cap." You need to punch them back down into the fermenting wine twice a day. You may use

your hands to punch the cap. A clean two-by-four works well also.

Once you decide your wine has had enough skin time, press the grapes to free any juice still trapped in the skins. The wine is set aside to finish fermentation and begin the aging process, either in barrels or in glass and stainless steel closed containers under a fermentation lock. Once fermentation is complete, the wine is racked

(pumped or siphoned away from the sediment). This process is repeated a month later and several more times before the wine is ready to be bottled. Small amounts of sulfite are added at each racking.

At some point the wine is fined by adding a clarifying agent. These agents combine with tiny particles and facilitate settling. The most common agent used by home winemakers is a

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Steve Aja loads the press (left) and helps author Byron Burch crush the grapes (below).



MITCH RICE

proprietary product called Sparkolloid, though a number of others may be used. Some winemakers go on to filter their wines, but that is optional.

With red wines bottling normally takes place nearly a full year after the grapes are crushed. You usually allow

the wine to remain in bulk storage until you need the fermentation and storage containers for the coming year's wine. People who have both the room and the storage capacity will often let the wine stay in storage for a second year before bottling.

White Wines

White wines are treated a little differently. First, the grapes are pressed prior to fermentation, and from then on you only work with the juice or wine itself. The juice is allowed to stand for a day, and then the clear juice is racked away from the sludge that settles to the bottom.

The juice is collected in oak, glass, or stainless steel closed containers filled no more than three-quarters full. Yeast is added, and fermentation is allowed to proceed under a fermentation lock. It is particularly important for white wines to be fermented under cool conditions. If the temperature can be kept under 70° F during fermentation, the wine's aromatic qualities will be significantly improved.

Aging, racking, and fining take place pretty much the same way for white wines as for reds but with some exceptions.

First, most of the lighter, fruitier white wines are ready to be bottled in spring.

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Second, white wines are much more sensitive to oxidation than red wines, and that requires some additional care in processing. A little splashing during the racking of a red wine is not likely to do any harm. With white wines, however, all splashing should be avoided. Hoses must always extend to the bottom of the container being filled. If pumping, you should select a pump that will cause the least possible aeration of the wine.

Bottling Time

At bottling time the wine is carefully removed from the settlings one last time and moved to a container that will serve as a bottling tank. The wine is given one last dose of sulfite. Also, if you feel a wine requires sweetening, that can be done to taste now using a simple sugar syrup (two parts household sugar boiled with one part water).

If sweetening a wine, you need to make sure it doesn't referment in the bottle. That is accomplished by adding

sulfite to weaken any remaining yeast and also using a yeast killer (potassium sorbate) to finish the job.

The wine is then siphoned into the bottles using a filler that extends to the bottom of the bottle so there will be as little splashing as possible. When the bottles are filled, put in the corks.

Corking wine bottles requires a special tool. The seal on a wine bottle is created by a cork that is too big to go in the bottle neck. The corking tool compresses the cork to make it fit and simultaneously pushes it into place.

The reason for using a compressed cork is to keep all the wine from leaking out when the bottle is stored on its side. The reason for storing the bottle on its side is to keep the cork moist, which helps keep the wine sound in storage.

Some wines will be ready to consume within three months of bottling. Others would be best left alone for another year or so. Lay the bottles in your cellar, and sample one now and again. You'll know when it's ready to

serve.

Wine grapes are now being grown in a number of states. In other states California grapes are shipped in at harvest time. If a major city near you has a large Italian or Portuguese community, try asking around.

Another option is making wine from frozen grapes. Brehm Vineyards, a company in Albany, Calif., freezes and ships premium must (reds) and juice (whites). Wines made from good-quality frozen grapes can be outstanding.

Wine's romantic imagery — not to mention its sacramental significance — tends to make it seem more mysterious than it needs to be. Making wine is not something we need to fear. It's actually fun, especially when you get a group of people together, and just as with beer, learning to make wine can teach us more about wine than can be learned any other way.

Byron Burch is the author of Brewing Quality Beer. He is currently writing a book about home winemaking.



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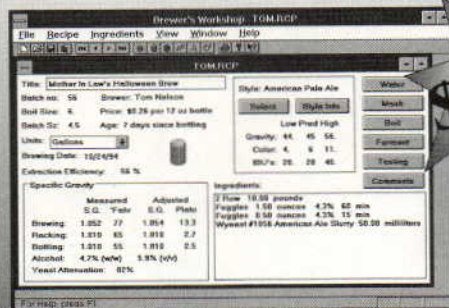
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FEEL THE

by Alex Fodor



THE HEAT

Adjusting Mash Temperature

When I look at my mash tun, I feel a sense of pride. When I withdraw my floating thermometer from the infusion of water and malt and it reads 150° F, I feel like a true brewmeister. Oh, but there were rocky times. I've overshot, underheated, scorched, and burned. I've been down with the iodine test blues. Looking back now, I can see why hitting my target mash temperature was so hard. As a naive young brewer, I had too little patience,



insufficient equipment and, worst of all, no propensity for heat transfer calculations. Now I know that with some minor advance planning any brewer can mash with style and accuracy. All you need is a little understanding — of energy flow.

Understanding Heat

Heat is the transfer of energy between two objects of different temperatures. If you touch your finger to a hot kettle, heat is immediately transferred from the metal to your skin. Heat will only flow from a higher temperature to a lower one. Because your finger is at a lower temperature, heat will flow to it until you finally have the sense to pull your finger away. Either that or the two will reach equilibrium. In this case your finger will increase in temperature and the kettle will decrease in temperature until the two reach the same point. (And your poor finger will be burned.)

This is basically what happens when the brewer mashes room-

temperature grains into hot water. The water loses heat to the atmosphere and to the grains the same way the kettle lost heat to the finger. The grains in turn increase in temperature as they are heated until finally the water and the grains reach an equilibrium that is (hopefully) somewhere around starch conversion temperature.

If this makes sense to you, then you understand the first law of thermodynamics. "The energy of an isolated system remains constant." Or more aptly put, the energy you put into your mash tun in the form of heat is conserved. With that said we know that by adding grain at a certain temperature to water at a certain temperature, we can predict the final temperature. What we don't know is how to do it with precision. That requires understanding (or at least using) heat transfer calculations.

Heat Transfer

Everything transfers heat at a different rate. A homebrewer's mash tun is a perfect example of this. Imagine

you have a fully insulated picnic cooler and a steel pot of the same volume. An equal amount of hot water is placed in each and their respective lids are placed over the top. An hour later the temperature of the water in the stainless steel pot has dropped by more than 10 degrees while the water in the picnic cooler has dropped only two or three degrees. Why did this happen? Steel conducts heat faster than the insulated material of the picnic cooler.

Every material, including malted barley and water, conducts heat differently. The amount of energy in the form of heat needed to raise a kilogram of malt by one degree is represented by a number called the specific heat. Likewise, there is a specific heat for water, wort, steel, air, and just about any other material you can imagine. By using the specific heat of malt and water along with their weights and temperatures, we can predict fairly accurately what temperature will result when the two are mixed in an insulated mash tun.



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Infusion Mashing

Traditional British brewers make their beers by infusion mashing. Infusion mashing involves heating water to a temperature higher than the desired mash conversion temperature, called the strike temperature.

In an insulated vessel the grains and the hot water are mixed. The heat of the water transfers to the malt and the mash reaches a temperature of 150° to 155° F. Using specific heat values for water and malt makes hitting the desired conversion temperature in an infusion mash easy.

H_m = heat capacity of malt
= 0.3822 Btu/lb. ° F

H_w = heat capacity of water
= 1 Btu/lb. ° F

T_{mt} = temp. of dry malt, ° F

T_w = temp. of water, ° F

T_{ma} = temp. of mash, ° F

M = weight of malt, lbs.

W = weight of water, lbs.

(1 gallon water = approx. 8.3 lbs.)

The equation:

$$W \times H_w \times (T_w - T_{ma}) = M \times H_m \times (T_{ma} - T_{mt})$$

Now apply the equation to the following Irish-style stout recipe.

Irish Stout (5 gallons, all-grain)

Ingredients:

- 6 lbs. two-row pale malt
- 1 lb. flaked barley
- 1 lb. roasted barley
- 0.5 lb. crystal malt, 40° Lovibond
- 0.9 oz. Northern Brewer hops (8% alpha acid), for 60 min.
- Ale yeast

Boil time = 1.5 hours

IBU = 25

OG = 1.049

FG = 1.012

Step by Step:

First, calculate the volume of mash water using 0.33 gals./lb. malt.

$$8.5 \text{ lbs. malt} \times 0.33 \text{ gals.} \\ = 2.8 \text{ gallons mash water}$$

Now, calculate the desired strike temperature.

H_m = heat capacity of malt
= .3822 Btu/lb. ° F

H_w = heat capacity of water
= 1 Btu/lb. ° F

T_{mt} = temp. of dry malt = 74° F

T_w = temp. of water = ?

T_{ma} = temp. of mash = 150° F

M = weight of malt in lbs = 8.5 lbs.

W = weight of water
= 2.8 gallons x 8.5 lbs = 23.8 lbs.

Now, substitute values into the equation and solve for T_w , the strike temperature.

$$W \times H_w \times (T_w - T_{ma}) = M \times H_m \times (T_{ma} - T_{mt})$$

$$23.8 \times 1 \times (T_w - 150^\circ) \\ = 8.5 \times .3822 \times (150^\circ - 74^\circ)$$

$$T_w = 160.4^\circ \text{ F}$$

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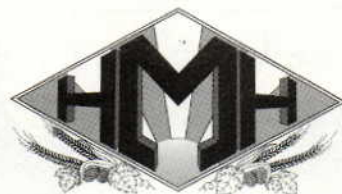
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For this brew a strike temperature of 160.4° F will drop to 150° F when the malt is mixed in.

When infusion mashing, use an insulated mash tun such as a picnic cooler or a pot wrapped in a sleeping bag. If you use a cooler, heat the mash water in a pot to a temperature slightly above your calculated strike temperature. Then transfer it to your mash tun. Close the lid and allow the temperature to come to equilibrium with the mash tun for two or three minutes. If the temperature is too high, add cold water by the cup until it reaches the strike temperature. If the temperature is too low, add boiling water. When the strike temperature is right, mix the grains in well. Cover with a lid and allow the solution to come to equilibrium for a few minutes. Then check to make sure the mash temperature is correct. Every time you open the lid, heat is lost to the atmosphere. So once you are satisfied that you have reached the right temperature, leave the mash alone for an hour and allow

the magic of conversion to happen.

Decoction Mashing

In Germany and continental Europe undermodified malt made decoction mashing a necessity. The heat-intensive mashing and the boiling process help degrade the starches so that enzymes can react more easily. In contrast the British infusion mash requires well-modified malt and needs no additional decomposition beyond the simple single-temperature conversion. Today's malts are generally sufficiently modified to make decoction mashing unnecessary. Still, many beer-style purists insist the boiling of the grains contributes important flavors unique to many German-style beers.

Decoction is a mechanical process in which steam vapor breaks down starch molecules. In the decoction mashing process water and malt may be combined at a lower temperature, such as 127° F, to allow protein-degrading enzymes to act. A large portion of the mash is then immediately removed

from the main mash and heated to 150° F to allow for a 15-minute starch conversion. The decoction is then boiled for another 15 minutes. Still boiling hot, the decoction is mixed into the main mash to increase the total mash temperature to 150° F. A second decoction can then be performed to increase the temperature of the main mash to 165° F, the mash-out temperature. These figures are just a rough guide.

Once again the homebrewer can turn to the world of heat transfer to make this rigorous mash schedule a simple task. The following recipe is for a medium-bodied German alt-style beer. If you prefer a partial mash, substitute 3.5 pounds of liquid malt extract for four pounds of pale malt and adjust the mash water volume accordingly.

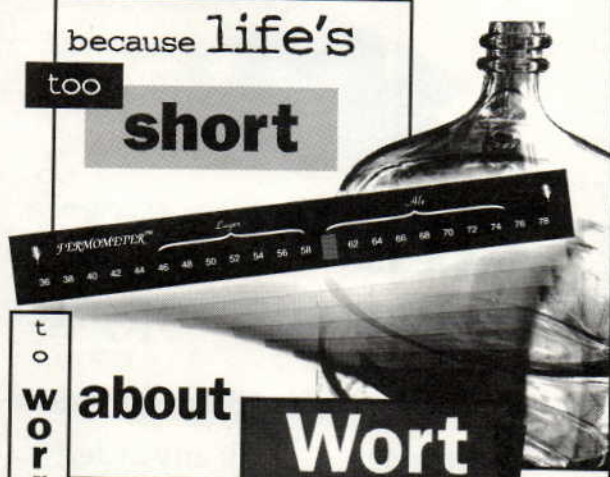
German Alt (5 gallons, all-grain)

Ingredients:

- 4 lbs. pale two-row malt
- 2 lbs. wheat malt

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- 2 lbs. Munich malt
- 0.5 lb. crystal malt, 20° Lovibond
- 1.5 oz. Perle hops (10% alpha acid), for 60 min.
- 1 oz. Perle hops (10% alpha acid), for 30 min.
- 2 oz. Mt. Hood hops (4.5% alpha acid), for 15 min.
- Alt or kolsh yeast

Boil time = 1.5 hours
 IBU = 28
 OG = 1.049
 FG = 1.010

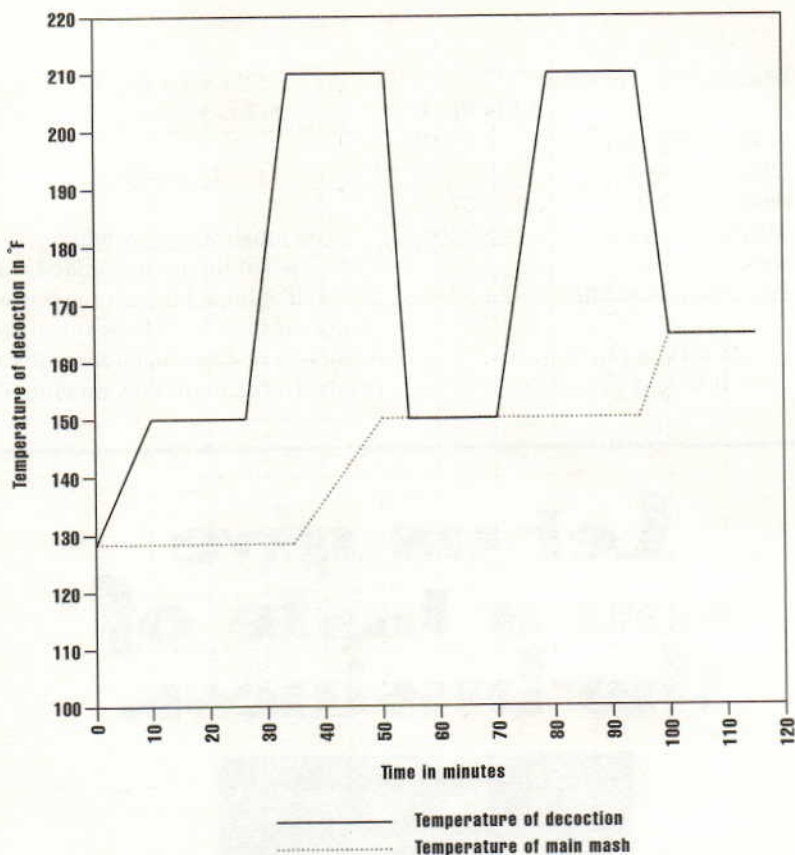
Step by Step:

Calculate the volume of mash water:

$$8.5 \text{ lbs.} \times 0.33 \text{ gallons/lb.} = 2.8 \text{ gallons}$$

Then calculate the initial strike temperature T_w for a protein rest at 127° F.

$$H_m = \text{heat capacity of malt} = 0.3822 \text{ Btu/lb.}^\circ \text{F}$$



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H_w = heat capacity of water
 = 1 Btu/lb.° F
 T_{mt} = temp. of dry malt = 74° F
 T_w = temp. of water = ?
 T_{ma} = temp. of mash = 127° F
 M = weight of malt = 8.5 lbs.
 W = weight of water
 = 2.8 gallons x 8.5 lbs. = 23.8 lbs.

$$23.8 \times 1 \times (T_w - 127^\circ)$$

$$= 8.5 \times .3822 \times (127^\circ - 74^\circ)$$

$$T_w = 134^\circ \text{ F}$$

The mash water should be at 134° F when the malt is added. After the malt is mixed in, the temperature should drop to 127° F. At this point a decoction will be pulled from the main mash. To calculate how much boiling

$$W \times H_w \times (T_w - T_{ma})$$

$$= M \times H_m \times (T_{ma} - T_{mt})$$

decoction mash is needed to raise the main mash from 127° F to 150° F, apply the following equation. The specific heat of the mash does not apply to this calculation, since the decoction and the main mash have about the same specific heat value.

T_d = Temp. of decoction = 212° F
 T_1 = Initial main mash temp. = 127° F
 T_2 = New main mash temp. = 150° F
 D = Weight of decoction mash = ?
 Z = Weight of main mash
 = $W + M = 23.8 + 8.5 = 32.3$ lbs.

$$D = [Z \times (T_2 - T_1)] / (T_d - T_1)$$

$$D = [32.3 \times (150^\circ - 127^\circ)] / (212^\circ - 127^\circ)$$

$$= 8.74 = 9 \text{ lbs.}$$

About nine pounds of decoction mash will be needed to raise the temperature of the main mash to 150° F. The same process can then be applied to the second decoction. In this case T_1 would be 150° F and T_2 would be 165° F.

I use a three-gallon pot for the decoction mash. The pot is weighed on a kitchen scale before I start. When the decoction is pulled from the main mash, the weight is immediately taken and adjusted to the calculated value. During the 15-minute starch conversion, I let the pot sit in the oven on low heat to keep the temperature up.

After boiling the decoction mash for 15 minutes, carefully stir the hot mixture into the main mash. Cover the mash tun and allow the temperature to come to equilibrium for a few minutes before checking. The heat calculation requires additional parts when dealing with decoction mashing due to the increased complexity of the process. However, I have had good results with the calculation and believe it takes most of the guess work out of decoction mashing.

The heat transfer calculations, one for combining water and malt and the other for mixing two mashes at different temperatures, are adaptable to a number of mash regimens. You just need the temperatures, the weights, and perhaps a little understanding.

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CIRCLE 57 ON READER SERVICE CARD

Take the Hassle Out of Cleaning Kegs

by Sal Emma and John Fogarty

Build a clean-in-place system for your kegs. All you need are a few basic materials. The result is simple, elegant, and inexpensive.

Homebrewers who have graduated to kegs generally agree that kegs stand head and shoulders above bottles in convenience and ease of cleaning. But even cleaning kegs can be a pain in the neck. The traditional way uses a lot of water and cleaning agents, because you have to fill the keg nearly to the top to ensure that the cleaning solution

comes in contact with the entire keg. Then the cleaning solution must be emptied, the keg well rinsed, and again filled, only this time with sanitizing solution.

That doesn't get the inner plumbing clean or sanitized, however. For that you have to run cleaning solution and sanitizer through the outflow fitting, using your compressed CO₂ to push it out. That often means hauling CO₂ canisters around the house to follow the process.

But there's an easier method.

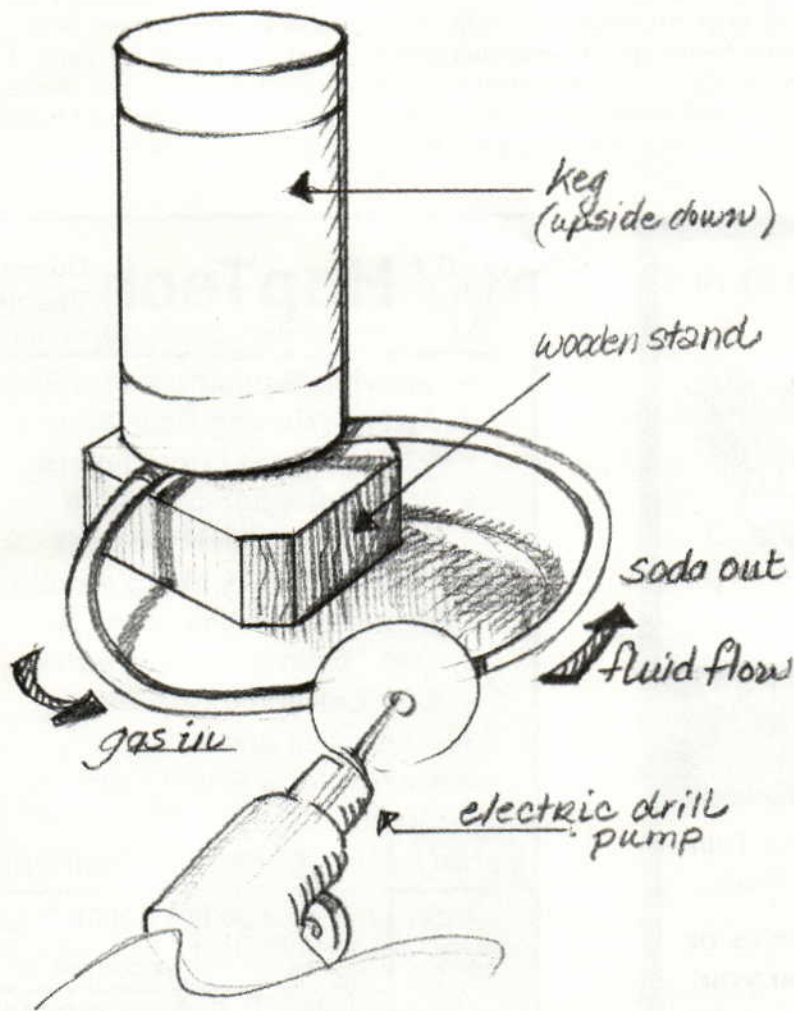
Professional brewers use a closed system commonly referred to as CIP or clean in place to clean and sanitize their equipment.

The traditional CIP system works like this: Put a little cleaning solution in the bottom of your vessel, seal it, and circulate the solution through the vessel's built-in spray-head system using an external pump. In the brewery caustic soda is used to clean, followed by a rinse, then sanitizer, each run in closed circuit for 30 to 60 minutes. Of course at home you can use more traditional home-brewery cleaning agents.

The Project

To apply the CIP concept to your homebrewery, you will need a few plumbing fittings and a simple pump. The parts will cost you less than \$25, assuming you already have an electric drill.

At first we toyed with the idea of modifying the gas-in tube with some sort of homemade spray head. Then inspiration struck and we decided to turn the keg upside down and connect the soda-out fitting to the outflow of the pump! It was a simple, elegant, and



KRISTINE BYBEE ILLUSTRATIONS

Parts List

All plumbing fittings are brass

- 1/4-inch utility power drill pump, 1 @ \$7
- 3/4-inch female garden hose x 3/8-inch male flare, 2 @ \$3 each
- 3/8-inch female flare x 1/4-inch barb, 2 @ \$1.75 each
- 1/4-inch barb x 1/4-inch female flare, to convert soda connectors to accommodate beverage tubing, 2 @ \$1 each
- Gas-in soda connector
- Soda-out soda connector
- Hose clamps
- Scraps of 2-by-4 to make 8-inch-square stand
- Nails or screws

For carboys add:

- 1/4-inch x 1/4-inch barb splicer, 1 @ \$1
- Large hose clamp

cheap solution to the spray-head problem. The idea is to create a pump system that will circulate fluid in the out tube and out the in tube. It will depend on what type of soda-out dip tube is in your keg. Remember, you need to get full coverage inside the keg. You may need to shorten the dip tube. The CIP flow will be reverse that of normal beer flow. In theory we assumed the cleaning solution should strike the bottom of the keg — turned upside down — and cascade down to the fitting side, where it drains back to the pump through the gas-in fitting.

Putting It Together

1 First, prepare your keg for future CIP cycles. Using a socket wrench, remove the soda-out fitting and the long dip tube. If you use Coca-Cola kegs, which have pin locks, you might need a special socket to remove the fittings. It's a 13/16-inch spark-plug socket with notches to accommodate the pins. These sell ready made for

\$15 to \$30, depending on the supplier. If you have access to the right tools, it's possible to make your own.

2 Then carefully and gently bend the tube into a shallow bow shape so that when it is replaced, the dip tube hovers above the center of the keg bottom instead of to one side. This will not adversely affect drawing beer. In fact if you do any fermentation in the keg, this will help to keep sediment out of your glass by raising the level of the out-tube.

3 Reassemble the keg tube when you get the bend right.

4 Assemble your CIP pump. Just about any pump will do, as long as you can connect each end to a soda keg connector fitting. Pumps can be a bit pricey, however, so we built this system using an inexpensive drill-operated utility pump that is available in many hardware and home-improvement stores.

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Cleaning agents can be hazardous, especially caustic solutions. Make sure your pump is not too big and does not create too much pressure, thus causing a burned hose or a loose fitting. Always wear eye protection.

The drill pump is made with male 3/4-inch garden hose threads on each side. To make your connections you will need two 3/4-inch female by 3/8-inch male flare brass fittings. To this fitting attach 3/8-inch female flare to 1/4-inch barb fittings. Then slip beverage tubing onto the barb end and clamp with small hose clamps. You can now attach two lengths of beverage tubing to the pump using the garden-hose fittings.

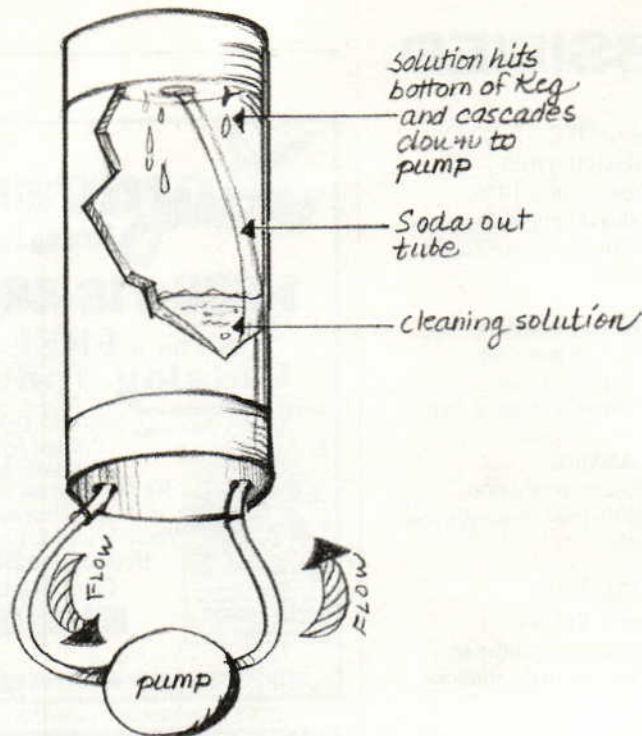
5 Next, attach your soda keg connectors to the opposite ends of the beverage tubing. Connect the beer-out fitting to the pump's outflow side. Connect the gas-in fitting to the inflow side of the pump. If you use standard soda fittings, you will need 1/4-inch barb by 1/4-inch female flares to

convert them to hose-barb connectors. If you use hose-barb soda connectors, you will not need these fittings.

6 Finally, you need to build a stand to keep the keg hose fittings

off the floor.

Make a simple square of wood two by fours, nailed or screwed together. The square should be eight inches or so, depending on the diameter of your kegs. The idea is to get the



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CIRCLE 53 ON READER SERVICE CARD

upside-down keg off the ground, with room for the fittings.

In Use

To test the system we dumped about a pound of dextrose in an empty keg, then shook and rolled it until the sugar dusted the entire inside of the keg. We figured if the system missed a spot, we would see remnants of sugar clinging to the missed places. After running the system with plain water for less than a minute, all the sugar was washed away. There were no dry spots.

To use the system, mix about a gallon of your favorite cleaning detergent solution in the keg. You can use C-brite, B-brite, sudsy ammonia, or automatic dishwasher detergent. Seal the top, put the keg upside down on the stand, then start the pump and let it run for 20 to 30 minutes. You'll need to put something heavy on top of the drill to keep it from spinning, unless you plan to hold it the whole time.

Give the keg a rinse, then add a gallon of iodine sanitizer mix and run the system again for 20 to 30 minutes (five minutes would do it, if you were in a hurry). You're done. All the internal plumbing gets the treatment and you only use a gallon of solution for each step. You can even reuse the cleaners and sanitizers for subsequent kegs and carboys.

Clean Carboys, Too!

To adapt the system for a carboy, buy a two-hole plastic carboy cap from your homebrew supplier. Shove a racking cane in one hole — that will be your CIP-in. Then connect the inflow side of the pump to the other hole, using a 1/4-inch by 1/4-inch barbed splicer. You should use hose clamps all around to prevent leaks and one big hose clamp around the plastic cap to prevent it from coming off when the carboy is upside down.

You might also need another two-by-four stand of the same dimensions as the first. Stack the two to create a single deeper stand that can accommodate the carboy.

Improvise. Use your imagination. Have fun while you save on water and chemicals! ■

Boyne River: Home of 10:30 Ale

by Stan Hieronymus and
Daria Labinsky

Cyndi and Scott Hill don't mind taking those late-night phone calls from barflies. The "flies" are usually old friends calling to let them know that a pint of the Hills' Boyne River Brewing Co. beer is sitting in front of them at some Detroit-area watering hole.

"We've had people call us from the Berkley Front (a popular suburban multi-tap) and say, 'We're down here drinking your beer,'" Cyndi Hill says.

A few years ago, the Hills moved 250 miles from suburban Detroit to set up a bottling microbrewery and brewpub in Boyne City, on Lake Charlevoix

in the northwestern part of Michigan's Lower Peninsula. Cyndi was an accountant and, later, a nurse, and Scott was in sales. "We hated our jobs, and he decided he wanted to go to beer school," Cyndi says. Scott studied at Chicago's Siebel Institute of Brewing Studies, and they visited brewpubs out West. Although he originally intended to work as a brewer in someone else's brewery, "the pay was just terrible, like \$7 an hour," Cyndi says. So they decided to go into business for themselves. Now, she jokes, "\$7 an hour has started to look good."

"We looked into opening down in the Detroit area, but they wanted to put us in an industrial park," Cyndi says. They visited Boyne City (population about 3,500) during vacation and decided the concept could work there, but they weren't sure how the townspeople were going to greet the project. "In Oakland County (near Detroit) they were really negative," she says. The Hills happened to be in Boyne City on the day the proposal came up on the city commission's agenda and surreptitiously sat in on the meeting. "When our issue came up, everyone was like, 'That would be so great.'"

"The concept was absolutely new to people up here," Scott Hill says. "When we first moved to Boyne City, there was nothing (in the realm of good beer) on the store shelves. That's starting to change."

Although the Hills created a brewpub that is as comfortable as suggested by its slogan, "Home of the Laid Back Ales," Boyne River is foremost a microbrewery. "Our concept coming in was that if this front part (the brewpub) doesn't make it, we can shut down and just do the brewery," Cyndi Hill says.

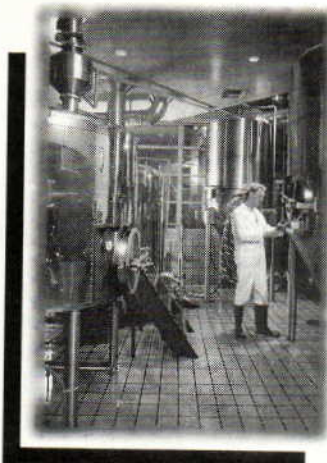
Adds Scott, "We didn't know if the distribution would go well, and we didn't know if the pub would go well, so we decided to do both."



The rustic building housing mismatched furniture and unique tap handles gives Boyne River a casual feel.



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Not surprisingly Scott brought a laid-back attitude to brewing and says he doesn't stick religiously to style guidelines. "We brew what we like to brew and go from there," he says. "And people seem to like what we're doing."

He uses only two-row British malts, saying he prefers their quality and adding, "There aren't a whole lot of suppliers who do pre-crushed malts." All the hops are domestic, and most of the beers are fermented with a London ale yeast. The pub usually keeps six beers on tap, with three or four available all the time. Scott describes some of the beers as tailored "for people who aren't into the beer scene," while other beers are more assertive.

The biggest seller, 10:30 Ale, is named after the fire whistle that punctuates the Boyne City air every night at that time. The beer is a light ale made with pale and wheat malt and lightly hopped. "It's closer to a 1040," Scott says, referring to the original gravity (1.040).

Log Jam Ale is an amber-type ale made with several different malts and Cascade hops, with about 28 International Bittering Units. Boyne River Pale Ale is made with three malts and hopped with Cascade, with 35 IBUs. The British-style brown ale features four malts and Chinook and Fuggle hops. Lake Trout Stout is made with five malts and Chinook hops. Boyne River also brews a Bavarian-style hefe-weizen, made with two-thirds wheat malt and Weihenstephan yeast. Other seasonals have included a pumpkin beer, jalapeño beer, and oatmeal stout.

While the Hills were busy hatching the brewery, Cyndi was pregnant with daughter Hannah, who was born about two months before the brewery opened. Hannah's Root Beer is named in her honor.

The beers have earned a good reputation in Michigan since the brewery went on line in July 1995. The brewery sold 945 barrels in 1996, about one-third of that in the pub and two-thirds through distributors. About 20 percent to 25 percent of off-premise sales are draft, the rest in bottles. Having a balance has been essential.

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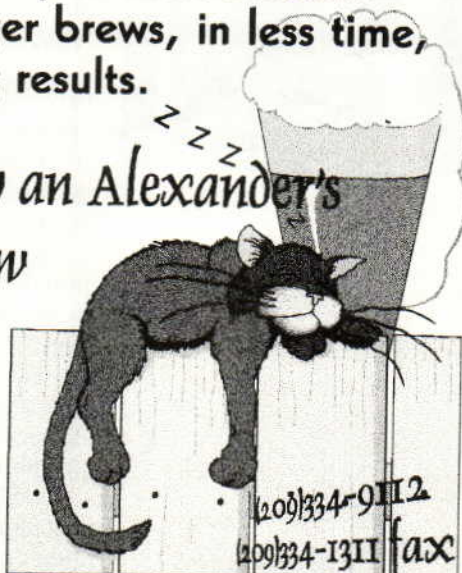
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very tough to do," Scott says. On the other hand sales of beer in southern Michigan help cash flow during slow months at the brewpub.

The Hills sought out their first distributor and started small, distributing in three local counties. Word-of-mouth brought more wholesalers to them, and eventually distribution spread to Detroit and environs and throughout much of the state. "A bar owner would ask us how to get the beer, or a tourist would want the beer back home," Cyndi says.

As summer approached this year — it doesn't hurry in Boyne City, where it snowed in mid-May and leaves didn't fill out the trees until June — full-time brewers Tony Vollmar and Bill Kroncke had plenty to keep them busy. They brewed two batches two days a week on used equipment acquired from a defunct Canadian brewer, following recipes Scott formulated. "Two days before you brew, you know you have to bottle two batches," Kroncke says. "It's bottle-brew, bottle-brew, and maybe squeeze in labeling somewhere." The bottle filler and labeler are somewhere between low- and high-tech, so Vollmar and Kroncke can bottle about 20 to 25 cases an hour and label about 10 to 15 cases an hour.

Originally, the brewery produced only 22-ounce bottles. Now, Vollmar and Kroncke also roll out 12-ounce six-packs, which has helped sales to restaurants. "A tap handle is the hardest thing to get in a restaurant," Cyndi Hill says. "If people want to try your beer, they don't want to have to buy a 22-ounce bottle."

Boyne River is set in a storage warehouse that was built at least 80 years ago and had several previous functions. The original corrugated siding and roof, plus plenty of wood inside, give the place a rustic feel. It looks like it has been around for years. Scott Hill and an assistant did the interior work, with help from Scott's mom. Scott made the tables, while the mismatched wooden chairs and stools were acquired at garage sales or traded by patrons for food. The rest of the decor is also "garage sale stuff" — fishing gear, snowshoes, skis, college team flags, a hockey stick, a life preserver. A stack of board

games stands against one wall, near a row of old theater seats. A foosball table is parked next to a real dart board. A large blackboard lists the beers available. Decorating the clever tap handles are an alarm clock for 10:30 Ale, a small pail for the pale ale, and a carved fish for Lake Trout Stout. Guests wishing to relax out in the beer garden have their choice of telephone company spools at which to sit.

The brewpub is more pub than restaurant, with the emphasis on beer rather than food. "The food is pretty much to keep people here," Cyndi Hill says. The first menu had three sandwiches and nachos. It has expanded a bit but remains basically a sandwich menu with a daily special such as chicken with pasta. Nothing on the menu is more than \$5, while pints are \$2.75.

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The pub is smoke free inside, which is still unusual in Michigan. "Michigan is a very smoky state," Cyndi says. "Everyone said, 'You can't have a bar and not have smoking.'" But being smoke-free has proven popular with many patrons, especially those with children. The brewpub is conveniently located near downtown Boyne City and is only a short walk from several hotels.

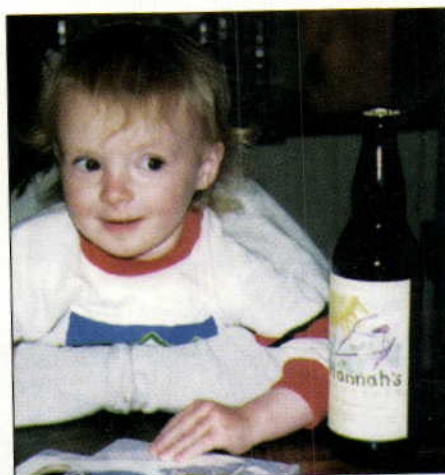
Boyne City has two main tourist seasons. Summer brings boaters and other beachgoers, and winter brings skiers to three nearby ski areas, so the brewpub's traffic is dependent upon those months. "April and November are the slowest," Cyndi Hill says. "July and August are pretty steady all week long, and weekends are steady in December and January. The week between Christmas and New Year's is Hell Week at the (Boyne Mountain ski area), and it's really crazy. It's a whole

The Hills' daughter, born two months before Boyne River opened, provided the inspiration behind Hannah's Root Beer.

week of Saturday nights."

The brewpub's mug club has more than 250 members, a few from as far as Port Townsend, Wash., and Fort Lauderdale, Fla. Club members will leave notes and even beer money in fellow members' mugs. "It's like a mailbox," Cyndi says.

The Hills recently opened a second brewpub, Bear River Brewing Co., in downtown Petoskey, about 15 miles north of Boyne City. Also smoke-free, the Petoskey brewpub is more of a restaurant than the



original, with a larger menu and a deck that gives patrons a view of Lake Michigan. The Hills take a hands-off approach to the Petoskey brewpub, letting managers run it. "(Boyne River) really depends on us," Cyndi says. "One of us has to be here all the time when it's open."

Under Michigan law, beer made at Boyne River can't be sold at Bear River, but Bear River can sell its beer off-premise, which is one reason the beers brewed there aren't identical to the ones in Boyne River. "Our intent is to market beer out of (Petoskey), so we want them to be different," Scott says. Additionally, he says, a second brewery gives him the freedom to make more kinds of beer.

"We brew beers we like to drink," he says. "We wouldn't make them if we didn't like them."

Boyne River Brewing Co., 419 East Main St., Boyne City, Mich. (616) 582-5588. ■

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

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Ain't Nothin' Like the First Time

by Rex Halfpenny

Remember your first time? It may not be your most cherished memory and perhaps it didn't turn out quite as you fantasized, but it probably was an important educational experience. This is the story of one such first time.

As siblings often do, Augie and his brother Pete discussed it for years. And whenever we met, they expressed the desire to do it. Homebrew, that is.

A while back, Augie, Pete, and roommate Sara threw a housewarming party. It was a simple open house, keg, chips-and-dip affair. When I arrived, I discovered a keg of Bud on tap, for which they deeply apologized. Augie had said they would have "a keg of something cool, like Newcastle Nut Brown Ale." Due to a twist of events, they had to settle for the "King of Beers." Ready for my reaction Pete quietly asked if I'd prefer a Guinness. "Sure," I answered, while handing him a brown grocery bag, "but check this out, dude. I brought five gallons of beer with me. You just gotta add water!"

Looking confused, he opened the paper sack and discovered a bock homebrew kit, three pounds of light dry malt extract, and one ounce of organic homegrown Cascade hops. Man, did his long face light up. For the next hour or so, beer and homebrewing were the topics of conversation. It was the best house-warming gift I ever bought.

On a subsequent Sunday around 9 p.m., Augie called to announce they were going to brew, and they had some questions. After getting past the "You realize you're going to be up four to five hours tonight doing this?" stage I spent the time to talk them through the process. Augie is my mountain-bike wrench (bicycle lingo for mechanic) and an expert trail-hammering mentor. Pete — mellow and down to

earth — is the chef of the house. Each has very different concerns and methods. Together, they even out each other's personality.

Augie called back a few days later to share their homebrew experience. "We began by opening a couple of Guinness stouts." The book Pete has actually says "step one, have a beer," a point Augie was compelled to make. "Everything was cool. We followed all the procedures. We boiled the extra water and put it in the carboy to cool down. Then we boiled more water, the bock extract, and the dry malt extract for the two hours..."

"Two hours?"



The author (left) finds that giving a homebrew kit has memorable results for friends Pete (center) and John "Augie" Augugliaro.

You mean one hour?" I interrupted. "Whatever it was supposed to be," countered Augie. "Pete was on top of that. We were feeling pretty confident, you know, sure of ourselves. We sanitized everything that would touch the beer in the bathtub (bathtub!?) with a couple of ounces of chlorine. After the boil we poured the contents of the kettle into the carboy." From his tone, I expected something to bust, so I butted in again. "And the carboy cracked

because of the hot wort?"

"Nope," answered Augie. "We got it all in the carboy with no problem at all. Everything was cool, that is, until we started to chill it. In less than a second, the whole carboy just exploded!"

I envisioned five gallons of hot sticky wort flooding their newly finished basement. Augie continued, "We both just stood there, with our mouths wide open. Then we began screaming (that one infamous word here)."

After laughing at this mental image I had of them crying over spilled wort, I finally empathized, "Bet you're still cleaning up the mess." Augie, some-

what thankfully responded, "Actually, we had the carboy in the big wash sink where we planned to cool it down. At the exact moment we turned on the faucet, (so that was it) the carboy blew out. We literally watched five gallons of beer go straight down the drain." I sympathized, adding, "Not to mention all those hours of work and planning."

"My brother was crushed way more than I was,"

Augie continued. "That (stuff) happens to me all the

time. It's just a part of life. But it was pretty traumatic for Pete. So the next morning I bought him a new carboy and more dry extract. I wanted to buy a new kit, too, but didn't know which one he'd want. Yesterday Pete purchased another bock kit. So we're thinking about brewing Sunday. You're welcome to come over and join us if you like."

"Sure Augie," I said, "sounds like a hoot, but just in case, let's review those wort-chilling procedures." ■

Do you have a 750-word story for Last Call? Mail it with a color photo to Last Call, c/o Brew Your Own, 216 F St., #160, Davis, CA 95616.



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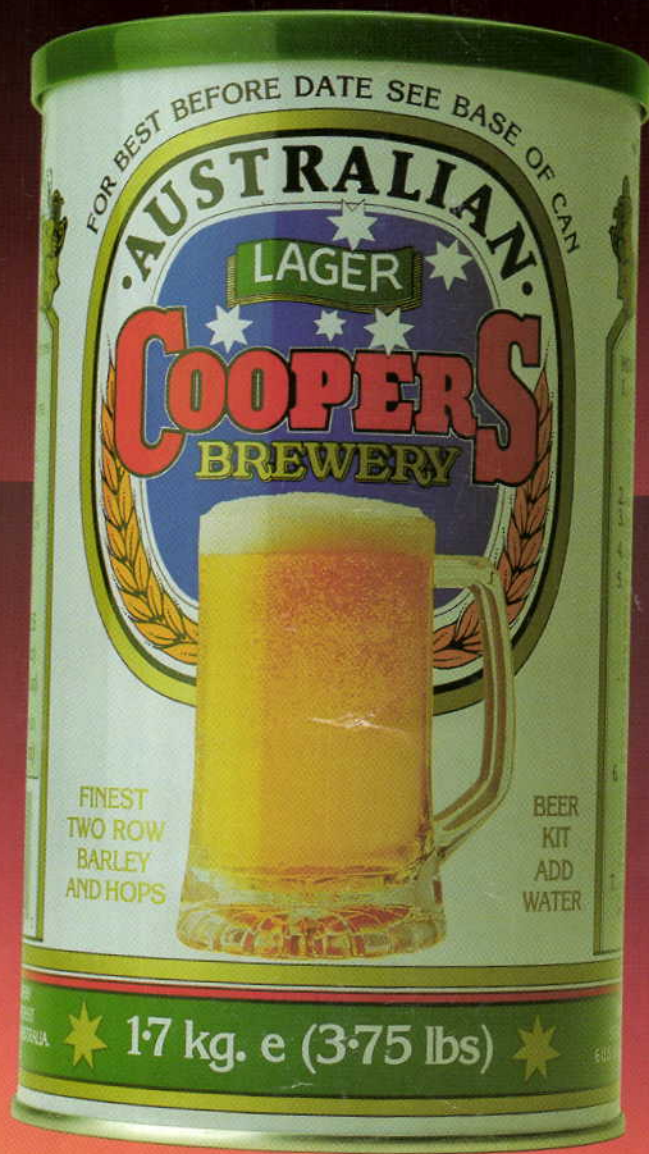
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